



MATHEMATICS TEST

60 MINUTES—60 QUESTIONS

Key

Directions: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

DO YOUR FIGURING HERE.

1. If $x = 3$, then $x^2 + 2x - 12 = ?$

- A. -3
- B. 0
- C. 3
- D. 6
- E. 21

9 + 6 - 12

2. If $3(2x - 1) = 11x + 27$, then $x = ?$

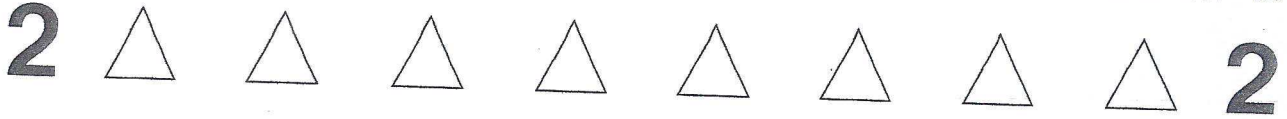
- F. -6
- G. -2
- H. 2
- J. 6
- K. 7

6x - 3 = 11x + 27
-30 = 5x

3. To make space for new merchandise, a clothing store offered a 15% discount on all current stock. What is the sale price of a jacket that regularly sells for \$42?

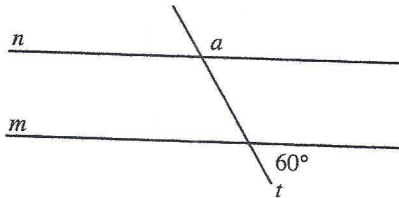
- A. \$6.30
- B. \$8.40
- C. \$35.70
- D. \$37.80
- E. \$41.85

42
x .15



DO YOUR FIGURING HERE.

4. In the figure below, line m is parallel to line n . One angle formed with transversal line t measures 60° , as shown. What is the degree measure of $\angle a$?



- F. 30°
 G. 60°
 H. 90°
 J. 120°
 K. Cannot be determined

5. If $x = 3$, $y = 5$, and $w = 4$, what is the value of

$$xw^3 + \frac{3w}{2} - x^2y?$$

- A. 9.0
 B. 12.0
 C. 79.5
 D. 153.0
 E. 1,689.0

$$3(4)^3 + \frac{3(4)}{2} - 3^2(5)$$

$$192 + 6 - 45$$

6. For all x , $(3x - 5)(4x + 3) = ?$

- F. $12x^2 - 15$
 G. $12x^2 + 11x - 15$
 H. $12x^2 - 11x - 15$
 J. $12x^2 + 29x - 15$
 K. $12x^2 - 29x - 15$

$$12x^2 - 11x - 15$$

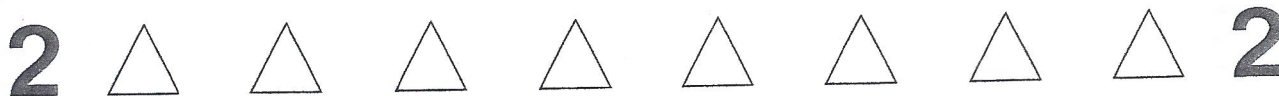
7. $|5 - 8| - |9 - 3| = ?$

- A. -9
 B. -3
 C. 1
 D. 3
 E. 9

$$3 - 6$$

8. $(5\sqrt{3})^2 = ?$

- F. 15
 G. $10\sqrt{6}$
 H. 45
 J. $34 + 10\sqrt{3}$
 K. 75



DO YOUR FIGURING HERE.

9. A carpet company uses the following formula for estimating the number of square feet, A , of carpeting needed for a room x feet by y feet, containing a stairway w feet by z feet, with n stairs:

$$A = xy + w[z(2n - 1) + 2n]$$

What is the company's estimate for the number of square feet of carpeting needed for a room that is 15 feet by 18 feet, containing a stairway that is 6 feet by 6 feet with 8 stairs?

- A. 826
 B. 894
 C. 906
 D. 1,086
 E. 1,636
10. An urn contains 7 blue balls, 5 white balls, and 3 red balls. What is the probability that the first ball drawn at random from the urn will NOT be red?

F. $\frac{7}{45}$

G. $\frac{1}{5}$

H. $\frac{1}{3}$

J. $\frac{7}{15}$

K. $\frac{4}{5}$

11. A certain watch costs \$100, and a certain pearl necklace costs \$300. If the cost of the watch increases by 5% and the cost of the pearl necklace decreases by 10%, what will be the sum of their new costs?

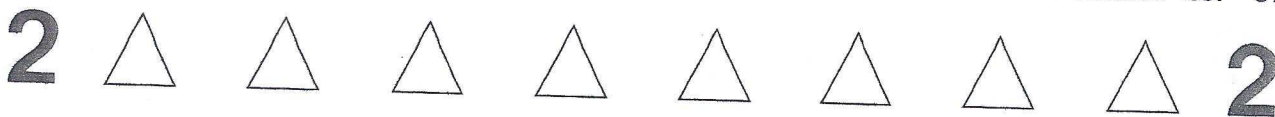
- A. \$375
 B. \$385
 C. \$395
 D. \$405
 E. \$415

$$15 \times 18 + 6[6(2(8) - 1) + 2(8)]$$

$$270 + 6(90 + 16)$$

$$\frac{12}{15}$$

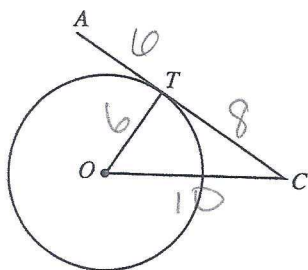
$$\begin{array}{r} 105 \\ 270 \\ \hline 375 \end{array}$$



DO YOUR FIGURING HERE.

12. In the figure below, \overline{CA} is tangent to circle O at point T . If $\overline{AT} = 6$ units, $\overline{CT} = 8$ units, and $\overline{CO} = 10$ units, how many units long is the radius of the circle?

- F. 2
- G. 5
- H. 6
- J. 8
- K. 10



13. If $A = BC$, $B = x$, and $C = yz$, then $AB = ?$

- A. $xyzx$
- B. $yzxy$
- C. $zxyz$
- D. $xyyz$
- E. xyz

$$\begin{aligned} A &= BC \\ B &= x \\ C &= yz \end{aligned}$$

$$\begin{aligned} A &= xyz \\ B &= x \\ AB &= x^2yz \end{aligned}$$

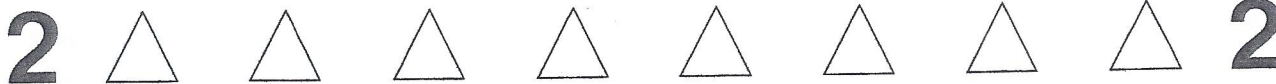
14. Which of the following inequalities specifies precisely the real values of x that are solutions to the inequality $-5 < -3x - 7$?

- F. $x < 4$
- G. $x < -\frac{2}{3}$
- H. $x > -\frac{2}{3}$
- J. $x < \frac{2}{3}$
- K. $x > 4$

$$\begin{aligned} 2 < -3x \\ -2 > 3x \\ \frac{-2}{3} > x \end{aligned}$$

15. What is the slope of the line determined by the equation $y - \frac{1}{3}x + \frac{3}{5} = 0$?

- A. 3
- B. 1
- C. $\frac{1}{3}$
- D. $-\frac{3}{5}$
- E. -3



DO YOUR FIGURING HERE.

16. Which of the following expresses the equation $4x - 2y = 12$ in slope-intercept form for the standard (x, y) coordinate plane?

F. $x = \frac{1}{2}y + 3$

G. $x = -\frac{1}{2}y + 3$

H. $y = 2x - 6$

J. $y = -2x + 6$

K. $y = -2x - 6$

$$\begin{aligned} -2y &= -4x + 12 \\ y &= 2x - 6 \end{aligned}$$

17. Which of the following values for a in the equation $3x + 3a - 5 = 5x - a$ causes the solution for x to be 6?

A. -8.5

B. -4.25

C. 4.25

D. 8.5

E. 13.25

$$\begin{aligned} 18 + 3a - 5 &= 30 - a \\ 3a + 13 &= 30 - a \\ 4a &= 17 \end{aligned}$$

18. The centers of 3 identically sized circles lie on the diameter of a larger circle, as shown in the figure below. Each of the 4 circles is tangent to 2 other circles, as shown. If the circumference of each small circle is 8π inches, what is the circumference of the largest circle, in inches?

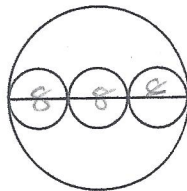
F. 16π

G. 24π

H. 48π

J. 64π

K. 144π



19. A recipe calls for cooking a turkey 1 hour for every 3 pounds it weighs. How long should a 19-pound turkey cook?

A. 6 hours and 15 minutes

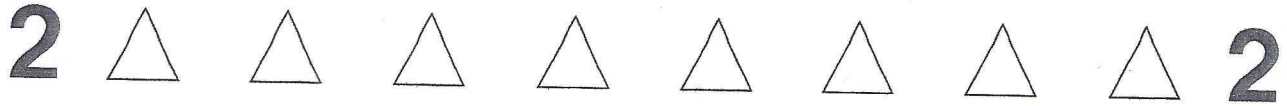
B. 6 hours and 20 minutes

C. 6 hours and 30 minutes

D. 6 hours and $33\frac{1}{3}$ minutes

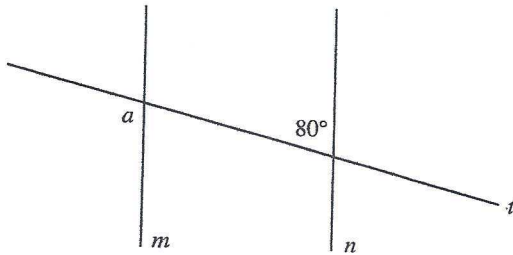
E. 6 hours and 40 minutes

$$\frac{1}{3} = \frac{x}{19}$$



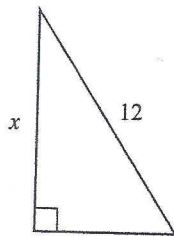
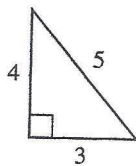
DO YOUR FIGURING HERE.

20. Line t intersects parallel lines m and n . Angle measures are as shown in the figure below. What is the degree measure of $\angle a$?



- F. 10°
- G. 80°
- H. 90°
- J. 100°
- K. 110°

21. A photocopy machine enlarges a small triangle to produce a larger, similar triangle, as shown below. If the lengths of the sides, in inches, are as marked on the figure, and the triangles are similarly oriented, what is the value of x in inches?



$$\frac{4}{3} = \frac{x}{12}$$

- A. $7\frac{1}{5}$
- B. 9
- C. $9\frac{1}{2}$
- D. $9\frac{3}{5}$
- E. 11

22. If the lengths of adjacent sides of a rectangular playground have measures of $4x - 3$ and $2x^2 + 7$ units, respectively, then which of the following expressions represents the area, in square units, of the playground?

- F. $2x^2 + 4x + 4$
- G. $4x^2 + 8x + 8$
- H. $8x^3 - 21$
- J. $8x^3 - 6x^2 + 28x - 21$
- K. $8x^3 + 6x^2 + 28x + 21$

$$(4x-3)(2x^2+7)$$

$$8x^3 - 6x^2 + 28x - 21$$

2



2

DO YOUR FIGURING HERE.

23. Which of the following is a prime factorization of 2,100?

- A. $2 \cdot 3 \cdot 5 \cdot 7$
- B. $2^2 \cdot 3 \cdot 5^2 \cdot 7$
- C. $2^2 \cdot 3 \cdot 5 \cdot 35$
- D. $2^2 \cdot 5^2 \cdot 21$
- E. $2^2 \cdot 550$

Handwritten work for Q23:
 2100
 $21 \overset{\wedge}{100}$
 $37 \ 2255$

24. After Jean spent 90% of her vacation money, \$100 remained. How much vacation money did she originally have?

- F. \$111
- G. \$191
- H. \$900
- J. \$1,000
- K. \$1,111

Handwritten work for Q24:
 $0.1(x) = 100$

25. Which of the following is a simplified version of

$\frac{2x+1}{x} - \frac{x-3}{5x}$ whenever $x \neq 0$?

- A. $9x + 2$
- B. $9x^2 + 2x$
- C. $\frac{-(x-4)}{4x}$
- D. $\frac{9x+8}{5x}$
- E. $\frac{9x^2+8x}{5x^2}$

Handwritten work for Q25:

$$\frac{10x+5 - x+3}{5x}$$

$$\frac{9x+8}{5x}$$

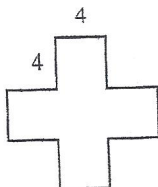
26. If $2x^2 - x - 15 = 0$, what are the 2 possible values for x ?

- F. -5 and $\frac{3}{2}$
- G. -3 and $\frac{2}{5}$
- H. -3 and $\frac{5}{2}$
- J. 3 and $-\frac{5}{2}$
- K. 5 and $-\frac{3}{2}$

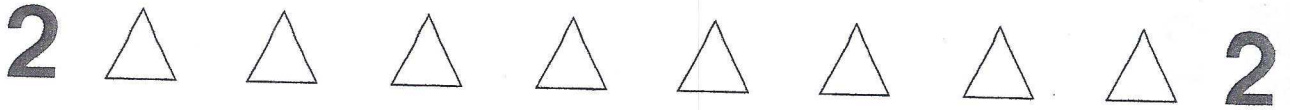
Handwritten work for Q26:
 $(2x+5)(x-3)$

27. All angles in the figure shown below are right angles. If each side has a length of 4 centimeters, what is the area of the figure in square centimeters?

- A. 32
- B. 40
- C. 44
- D. 48
- E. 80



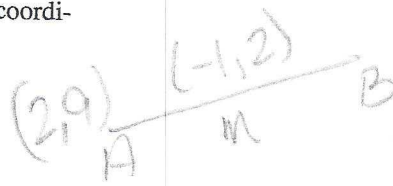
Handwritten work for Q27:
 16×5



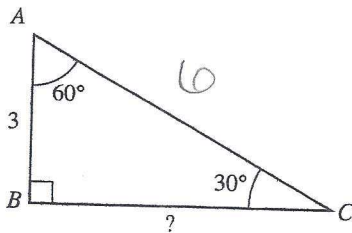
DO YOUR FIGURING HERE.

28. If M , located at $(-1, 2)$, is the midpoint of \overline{AB} , and the coordinates of A are $(2, 9)$, what are the coordinates of B ?

- F. $(-5, 16)$
- G. $(-4, -5)$
- H. $(0.5, 5.5)$
- J. $(4, -5)$
- K. $(5, 16)$



29. In the figure below, lengths in units and angle measures in degrees are as marked. How many units long is \overline{BC} ?



- A. 3
- B. $3\sqrt{2}$
- C. $3\sqrt{3}$
- D. 6
- E. $3\sqrt{5}$

30. To increase the mean of 5 numbers by 3, by how much would the sum of the 5 numbers need to increase?

- F. 3
- G. 6
- H. 9
- J. 15
- K. 18

31. Josh pounded a stake into the ground. When he attached a leash to both the stake and his dog's collar, the dog could walk 12 feet from the stake in any direction. Using 3.14 for π , what is the approximate area of the lawn, in square feet, that the dog could roam while tied to the stake?

- A. 38
- B. 75
- C. 151
- D. 377
- E. 452





32. Television screen sizes are determined by the diagonal length of the rectangular screen. Chad recently changed from watching a television with a 19-inch screen to a television with a similarly shaped 32-inch screen. If a car on the 19-inch screen appeared 12 inches long, how long, to the nearest inch, would the same car appear on the 32-inch screen?

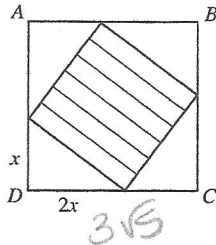
DO YOUR FIGURING HERE.

$$\frac{12}{19} = \frac{x}{32}$$

- F. 16
- G. 18
- H. 20
- J. 22
- K. 24

33. In the figure below, $ABCD$ is a square. Points are connected on each pair of adjacent sides of $ABCD$ to form 4 congruent right triangles, as shown below. Each of these triangles has one leg that is twice as long as the other leg. If the area of the shaded region is 25 square feet, what is the area of square $ABCD$ in square feet?

- A. 225
- B. 112.5
- C. 56.25
- D. 45
- E. 27

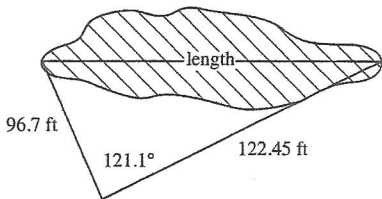


$$x^2 + (2x)^2 = 5^2$$

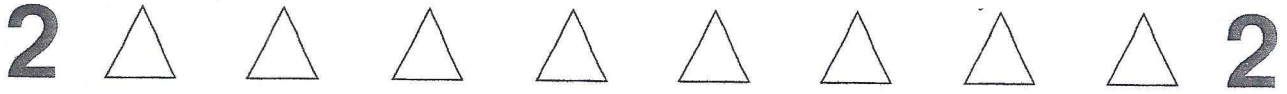
$$5x^2 = 25$$

$$x = 5$$

34. A surveyor took and recorded the measurements shown in the figure below. If the surveyor wants to use these 3 measurements to calculate the length of the pond, which of the following would he find to be the most useful?



- F. The Pythagorean Theorem
- G. The ratios for the side lengths of $30^\circ-60^\circ-90^\circ$ triangles
- H. The ratios for the side lengths of $45^\circ-45^\circ-90^\circ$ triangles
- J. The law of cosines, which states that for any $\triangle ABC$, where a is the length of the side opposite $\angle A$, b is the length of the side opposite $\angle B$, and c is the length of the side opposite $\angle C$, $a^2 = b^2 + c^2 - 2bc[\cos(\angle A)]$
- K. The law of sines, which states that the ratio between the length of the side opposite an angle and the sine of that angle is the same for all of the interior angles in the same triangle.

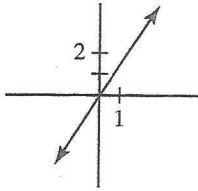


DO YOUR FIGURING HERE.

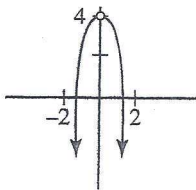
35. Which of the following is the graph of the equation

$$y = \frac{4x - 2x^2}{x} \text{ in the standard } (x, y) \text{ coordinate plane?}$$

A.

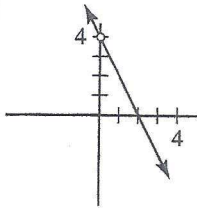


B.

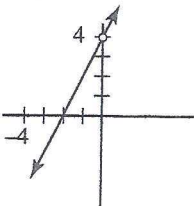


Handwritten: $y = 4 - 2x$

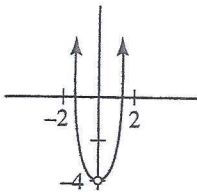
C.



D.

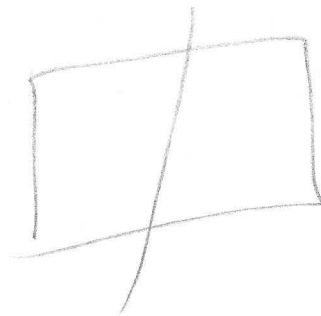


E.



36. A line in a plane separates the plane into how many sets of points that do not contain the line?

- F. 0
- G. 1
- H. 2
- J. 3
- K. Cannot be determined

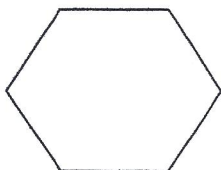




DO YOUR FIGURING HERE.

37. What is the maximum number of distinct diagonals that can be drawn in the hexagon shown below?

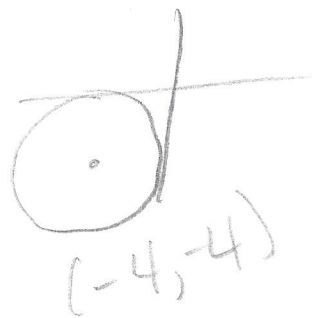
- A. 12
- B. 9
- C. 6
- D. 5
- E. 4



Diagonals = $\frac{n(n-3)}{2}$

38. In the standard (x, y) coordinate plane, the center of a circle lies in quadrant III. If the circle is tangent to the x -axis and the y -axis, which of the following is an equation for the circle?

- F. $(x + 4)^2 + (y + 4)^2 = 4$
- G. $(x - 4)^2 + (y - 4)^2 = 4$
- H. $x^2 + (y - 4)^2 = 16$
- J. $(x + 4)^2 + (y + 4)^2 = 16$
- K. $(x + 4)^2 + (y - 4)^2 = 16$

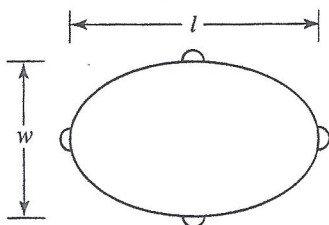


39. How must $-\frac{3}{5}$, $-\frac{4}{7}$, $-\frac{5}{6}$, and $-\frac{8}{9}$ be arranged so that they are listed in increasing order?

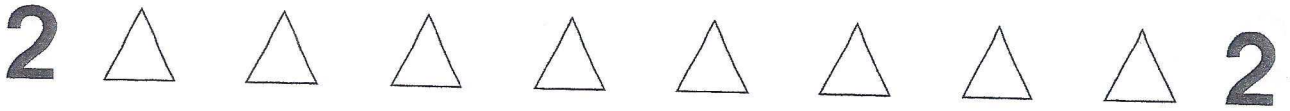
- A. $-\frac{8}{9} < -\frac{5}{6} < -\frac{3}{5} < -\frac{4}{7}$
- B. $-\frac{8}{9} < -\frac{5}{6} < -\frac{4}{7} < -\frac{3}{5}$
- ~~C. $-\frac{4}{7} < -\frac{3}{5} < -\frac{5}{6} < -\frac{8}{9}$~~
- ~~D. $-\frac{3}{5} < -\frac{4}{7} < -\frac{5}{6} < -\frac{8}{9}$~~
- ~~E. $-\frac{5}{6} < -\frac{8}{9} < -\frac{3}{5} < -\frac{4}{7}$~~

40. The perimeter of an elliptical billiard table is to be covered with red velvet. The perimeter of an ellipse is given by the formula $p = \frac{\pi}{2} \sqrt{2(l^2 + w^2)}$, where l is the length and w is the width, as shown in the diagram below. If the length is 4 feet and the width is 3 feet, what is the outside perimeter of the ellipse in feet?

- F. $\frac{5}{2} \pi \sqrt{2}$
- G. $\frac{\pi}{2} (4\sqrt{2} + 3)$
- H. $\frac{7}{2} \pi \sqrt{2}$
- J. $(4\pi + 3)\sqrt{2}$
- K. $5\pi\sqrt{2}$



$\frac{\pi}{2} \sqrt{50}$
 $\frac{5\pi\sqrt{2}}{2}$



DO YOUR FIGURING HERE.

41. If $\frac{A}{28} + \frac{B}{126} = \frac{9A+2B}{x}$, and A , B , and x are integers greater than 1, what must x equal?

- A. 11
- B. 154
- C. 252
- D. 1,134
- E. 3,528

$$9\left(\frac{A}{28}\right) + 2\left(\frac{B}{126}\right)$$

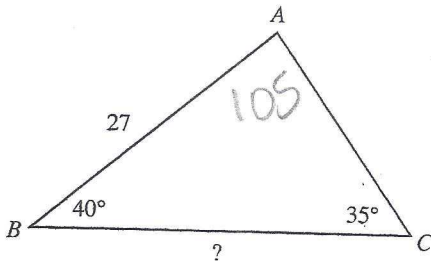
42. Which one of the following expresses the number of meters that a contestant must travel in a 5-lap race around a circular track with a radius of R meters?

- F. $5R$
- G. $5\pi R$
- H. $5\pi R^2$
- J. $6R$
- K. $10\pi R$

$$5(2\pi R)$$

43. In $\triangle ABC$, shown below, the measure of $\angle B$ is 40° , the measure of $\angle C$ is 35° , and \overline{AB} is 27 units long. Which one of the following is an expression of the length, in units, of \overline{BC} ?

(Note: The law of sines states that for any triangle, the ratio between the sine of an angle and the length of the side opposite that angle is the same for all of the interior angles in the triangle.)



- A. $\frac{27(\sin 105^\circ)}{\sin 40^\circ}$
- B. $\frac{27(\sin 105^\circ)}{\sin 35^\circ}$
- C. $\frac{27(\sin 75^\circ)}{\sin 40^\circ}$
- D. $\frac{27(\sin 40^\circ)}{\sin 105^\circ}$
- E. $\frac{27(\sin 35^\circ)}{\sin 75^\circ}$

$$\frac{\sin 105}{x} = \frac{\sin 35}{27}$$

$$\frac{27 \sin 105}{\sin 35} = x$$



DO YOUR FIGURING HERE.

Use the following information to answer questions 44–45.

Kaylee is planning to purchase a car. She will need to borrow some of the money and has a chart, shown below, that will help her to approximate her monthly payment. The chart gives the approximate monthly payment per \$1,000 borrowed.

Monthly payment per \$1,000 borrowed for various annual rates and various numbers of payments.			
Annual Interest Rate	Number of Monthly Payments		
	36	48	60
5%	\$29.97	\$23.03	\$18.87
6%	\$30.42	\$23.49	\$19.33
8%	\$31.34	\$24.41	\$20.28
10%	\$32.27	\$25.36	\$21.24
12%	\$33.22	\$26.34	\$22.24

44. Kaylee found a used car that she is thinking about purchasing. The list price is \$8,785. She calculates that she will need to borrow \$6,500. Approximately what would her monthly payment be if she borrowed the money for 36 months at an annual interest rate of 10%?

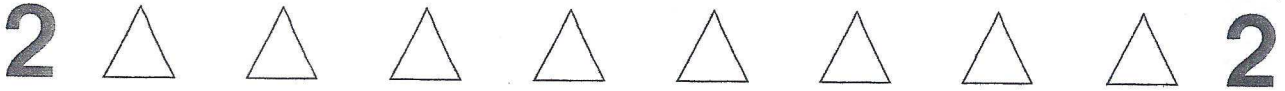
32.27 x 6.5

- F. \$164.84
- G. \$171.21
- H. \$209.76
- J. \$234.72
- K. \$283.81

45. A local dealership is having an end-of-the-model-year clearance sale and is offering 5% annual interest on new-car loans for 36, 48, or 60 months. The maximum amount that Kaylee can budget for her monthly car payment is \$300. Of the following loan amounts, which one represents the maximum amount that Kaylee can borrow at 5% annual interest while staying within her budget?

60 mon is least
18.87(x) = 300

- A. \$10,000
- B. \$13,000
- C. \$14,000
- D. \$15,000
- E. \$20,000



46. For $i^2 = -1$, $(5 - i)^2 = ?$

- E. 24
- G. 26
- H. $24 - 5i$
- J. $24 - 10i$
- K. $26 + 10i$

$25 - 10i + i^2$
 $24 - 10i$

DO YOUR FIGURING HERE.

47. If x and y are integers such that $y > 12$ and $2x + y = 19$, which of the following is the solution set for x ?

- A. $x \geq 4$
- B. $x \geq 3$
- C. $x \leq 4$
- D. $x \leq 3$
- E. $x \leq 0$

$y = -2x + 19$
 $-2x + 19 > 12$
 $-2x > -7$
 $x < 3.5$

48. If $pq^3r^4 > 0$, which of the following products must be positive?

- E. pq
- G. pt
- H. qt
- J. pqt
- K. pq^2

$t \rightarrow + \text{ or } -$
 if $P +$ then $Q +$

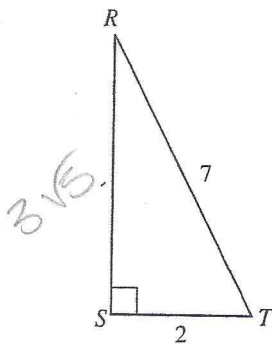
49. If $\log_3 81 = x + 1$, then $x = ?$

- A. 3
- B. 4
- C. 5
- D. 6
- E. 243

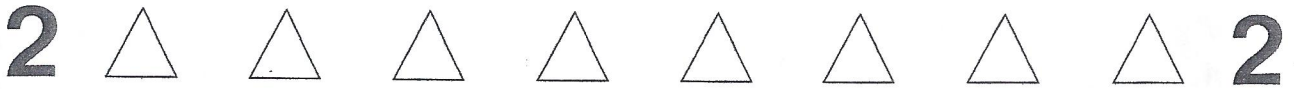
$3^{x+1} = 81$
 $3^{x+1} = 3^4$

50. In $\triangle RST$ below, $\angle S$ is a right angle, $\overline{RT} = 7$ units, and $\overline{TS} = 2$ units. What does $\csc \angle T$ equal?

- E. $\frac{2\sqrt{5}}{15}$
- G. $\frac{3\sqrt{5}}{7}$
- H. $\frac{7\sqrt{5}}{15}$
- J. $\frac{3\sqrt{5}}{2}$
- K. $\frac{7}{2}$



$\csc = \frac{\text{hyp}}{\text{opp}}$ $\frac{7}{3\sqrt{5}}$
 $\frac{7\sqrt{5}}{15}$



51. A flight instructor charges \$75 per lesson, plus an additional fee for the use of his plane. The charge for the use of his plane varies directly with the cube root of the time the plane is used. If a lesson plus 27 minutes of plane usage costs \$120, what is the total amount charged for a lesson involving 64 minutes of plane usage?

- A. \$195
- B. \$180
- C. \$157
- D. \$135
- E. \$60

DO YOUR FIGURING HERE.

$$P = k \sqrt[3]{t}$$

$$(120 - 75) = k \sqrt[3]{27}$$

$$45 = k \sqrt[3]{27}$$

$$k = 15$$

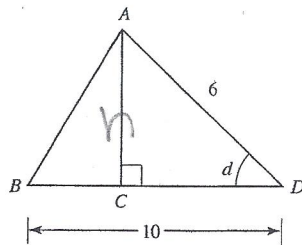
$$P = 15 \sqrt[3]{t}$$

$$= 15 \sqrt[3]{64}$$

$$60 + 75$$

52. In $\triangle ABD$ shown below, C is on \overline{BD} , $\overline{AC} \perp \overline{BD}$, the length of \overline{AD} is 6 inches, the length of \overline{BD} is 10 inches, and $\sin d = 0.8$. What is the area of $\triangle ABD$ in square inches?

- F. 6
- G. 12
- H. 24
- J. 30
- K. 60



$$\sin d = .8 = \frac{\text{opp}}{\text{hyp}} = \frac{h}{6}$$

$$\frac{h}{6} = .8$$

$$h = 4.8$$

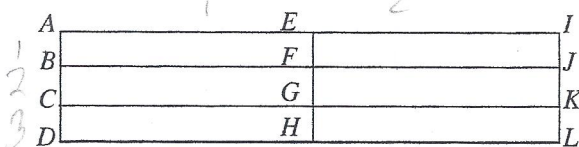
53. For real numbers x and y , when is the equation $|2x + 3y| = |2x - 3y|$ true?

- A. Never
- B. Always
- C. Only when $2x = 3y$
- D. Only when $x = 0$ and $y = 0$
- E. Only when $x = 0$ or $y = 0$

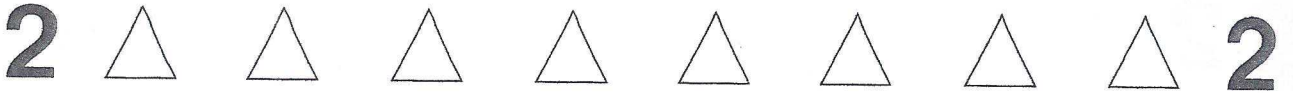
Go through choices

54. In the figure below, all line segments that intersect are perpendicular. Using only the segments and vertices in the figure, how many distinct rectangles are there with areas less than the area of $ADLI$?

(Note: If 2 rectangles have all four vertices in common, then they are not distinct.)



- F. 7
- G. 8
- H. 17
- J. 18
- K. 19



55. For some real number A , the graph of $y = (A + 3)x + 5$ in the standard (x, y) coordinate plane passes through the point $(3, 11)$. What is the slope of this line?

- A. -5
- B. -2
- C. -1
- D. 2**
- E. $5\frac{1}{3}$

DO YOUR FIGURING HERE.

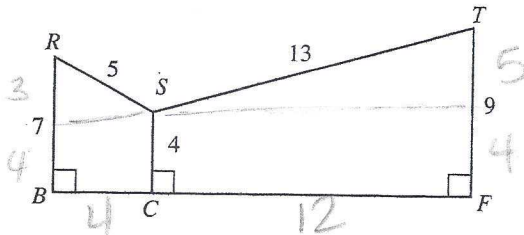
$$11 = (A+3)(3) + 5$$

$$6 = 3(A+3)$$

$$2 = A+3$$

$$A = -1$$

56. In the figure below, \overline{BCF} is a line segment and all distances are given in inches. What is the ratio of the area of quadrilateral $RBCS$ to the area of quadrilateral $SCFT$?



- F. 9:7
- G. 7:9
- H. 11:13
- J. 11:39**
- K. 11:50

$$RBCS = \frac{1}{2} (4+7)(4)$$

$$SCFT = \frac{1}{2} (4+9)(12)$$

$$\frac{11}{3(13)}$$

57. When graphed in the standard (x, y) coordinate plane, the graphs of $y = x^2 - 5$ and $y = x + 1$ intersect at which of the following points?

- A. $(-3, 2)$ and $(2, 3)$
- B. $(-3, 4)$ and $(2, -1)$
- C. $(3, -4)$ and $(-2, 1)$
- D. $(3, 4)$ and $(-2, -1)$**
- E. The graphs do not intersect.

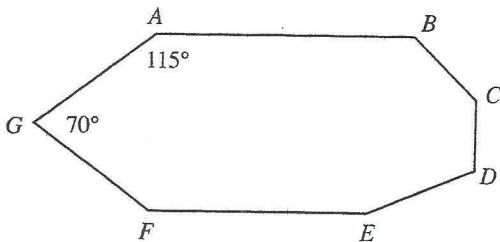
$$x+1 = x^2 - 5$$

$$0 = x^2 - x - 6$$

$$(x-3)(x+2)$$

$$x = 3, -2$$

58. In septagon $ABCDEFG$ shown below, $\angle A = 115^\circ$ and $\angle G = 70^\circ$. What is the sum of the measures of the other 5 interior angles?



- F. 585°
- G. 595°
- H. 655°
- J. 690°
- K. 715°**

$$(7-2)180 - (185) =$$

$$\frac{900}{-185}$$

$$715$$

50 6 ACT Practice Tests



59. For all real numbers x and y such that the product of y and 4 is x , which of the following expressions represents the sum of y and 4 in terms of x ?

- A. $x + 4$
 B. $4x + 4$
 C. $4(x + 4)$
 D. $\frac{x+4}{4}$
 E. $\frac{x+16}{4}$

DO YOUR FIGURING HERE.

Handwritten work for Question 59:

$$4y = x \quad y = \frac{x}{4}$$

$$y + 4 = \frac{x}{4} + 4$$

60. What is $\cos \frac{7\pi}{12}$ given that $\frac{7\pi}{12} = \frac{\pi}{3} + \frac{\pi}{4}$ and that $\cos(A+B) = \cos A \cos B - \sin A \sin B$?
 (Note: You may use the following table of values.)

θ	$\sin \theta$	$\cos \theta$
$\frac{\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$
$\frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$

- F. $\frac{\sqrt{2} - \sqrt{6}}{4}$
 G. $-\frac{1}{4}$
 H. $\frac{\sqrt{2} - \sqrt{3}}{4}$
 J. 0.999
 K. $\frac{1 + \sqrt{2}}{2}$



If there is still time remaining, check your answers to this section.

Answer Key

PRACTICE TEST 1

English Test

1. B	16. F	31. B	46. H	61. D
2. J	17. A	32. J	47. A	62. G
3. A	18. F	33. D	48. H	63. D
4. J	19. B	34. F	49. B	64. F
5. D	20. F	35. A	50. H	65. C
6. H	21. C	36. G	51. D	66. F
7. C	22. G	37. C	52. F	67. D
8. F	23. D	38. J	53. B	68. H
9. D	24. H	39. A	54. H	69. A
10. J	25. A	40. H	55. C	70. G
11. B	26. F	41. B	56. F	71. D
12. H	27. B	42. J	57. B	72. H
13. A	28. J	43. B	58. H	73. B
14. G	29. C	44. J	59. A	74. J
15. A	30. J	45. C	60. H	75. C

Math Test

1. C	13. A	25. D	37. B	49. A
2. F	14. G	26. J	38. J	50. H
3. C	15. C	27. E	39. A	51. D
4. J	16. H	28. G	40. F	52. H
5. D	17. C	29. C	41. C	53. E
6. H	18. G	30. J	42. K	54. H
7. B	19. B	31. E	43. B	55. D
8. K	20. J	32. H	44. H	56. J
9. C	21. D	33. D	45. D	57. D
10. K	22. J	34. J	46. J	58. K
11. A	23. B	35. C	47. D	59. E
12. H	24. J	36. H	48. F	60. F

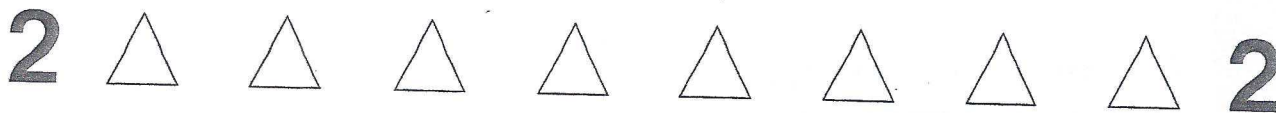
Score Conversion Table

Section	Raw Score	Scaled Score
English	(out of 75)	___ / 36
Math	(out of 60)	___ / 36
Reading	(out of 40)	___ / 36
Science	(out of 40)	___ / 36
		Add and divide by 4
Overall Composite =		___ / 36

Score Conversion Chart

ACT Score	Number Correct				ACT Score*
	English Section	Mathematics Section	Reading Section	Science Section	
36	75	60	40	40	36
35	74	59	39	—	35
34	73	58	38	39	34
33	72	57	37	—	33
32	71	56	36	38	32
31	70	54–55	35	—	31
30	69	53	34	37	30
29	67–68	51–52	33	36	29
28	65–66	49–50	32	35	28
27	64	46–48	31	33–34	27
26	62–63	44–45	30	31–32	26
25	60–61	41–43	29	30	25
24	58–59	39–40	27–28	28–29	24
23	55–57	37–38	25–26	27	23
22	53–54	35–36	23–24	25–26	22
21	50–52	33–34	22	23–24	21
20	47–49	31–32	21	21–22	20
19	44–46	28–30	19–20	19–20	19
18	42–43	25–27	18	17–18	18
17	40–41	22–24	17	15–16	17

Continued



MATHEMATICS TEST

Directions: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

DO YOUR FIGURING HERE.

1. What is the value of the expression $(y - x)^3$ when $x = 5$ and $y = 1$?
 - A. -64
 - B. -4
 - C. 4
 - D. 16
 - E. 64

2. What is the smallest positive integer that is divisible by 3, divisible by 5, and divisible by 6 (with no remainders)?
 - F. 15
 - G. 30
 - H. 60
 - J. 90
 - K. 180

3. If $[-s + h(t \cdot 3 - w)]r = 1$, then which of the following variables CANNOT equal 0?
 - A. h
 - B. r
 - C. s
 - D. t
 - E. w

LCM 3, 5, 6



DO YOUR FIGURING HERE.

4. In a certain school district, exactly 30% of the students come from families that have only one child. If there are 7,340 students in the district, how many do NOT come from families with only one child?

F. 220
 G. 514
 H. 2,202
 J. 5,138
 K. 7,120

$$.7(7340)$$

5. For all $x < 3$, $(3 - 2x)^2 = ?$

A. x^2
 B. $9 - x^2$
 C. $9 + x^2$
 D. $9 - 10x - 4x^2$
 E. $9 - 12x + 4x^2$

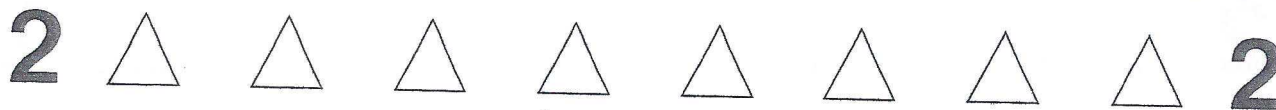
6. What is the slope-intercept form of the equation $3y + 2x = 24$?

F. $y = -\frac{2x}{3} + 8$
 G. $y = -\frac{3x}{2} + 12$
 H. $3 = 2m + b$
 J. $m = 2b + 24$
 K. $y = 2x + 24$

7. What is the slope of a line perpendicular to the line $3x + 2y = 19$?

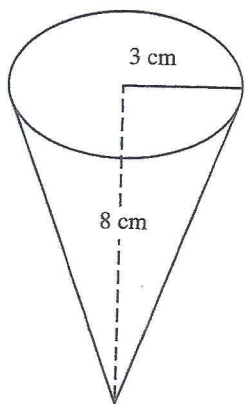
A. $-\frac{3}{2}$
 B. $-\frac{2}{3}$
 C. $\frac{2}{3}$
 D. $\frac{3}{2}$
 E. 3

$$\rightarrow m = -\frac{3}{2}$$



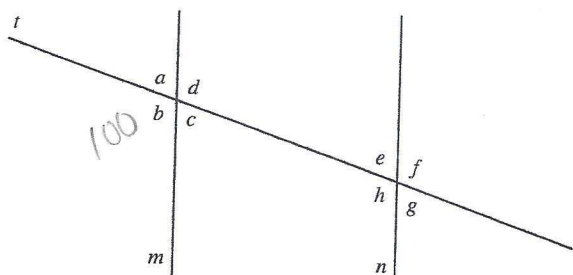
DO YOUR FIGURING HERE.

8. The volume of a cone is given by the formula $V = \frac{\pi}{3}r^2h$, where r is the radius of the base of the cone and h is the height of the cone. What is the volume, in cubic centimeters, of a cone with a height of 8 cm that has a base with a radius of 3 cm?

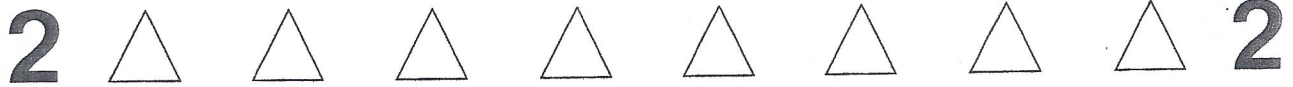


$$\frac{\pi}{3}(3)^2(8)$$

- F. 72π
 G. 48π
 H. 24π
 J. 12π
 K. 8π
9. Given that m and n are parallel lines, t is a transversal crossing both m and n , and $m \angle b = 100^\circ$, what is the measure of $\angle e$?



- A. 40°
 B. 50°
 C. 80°
 D. 100°
 E. 120°

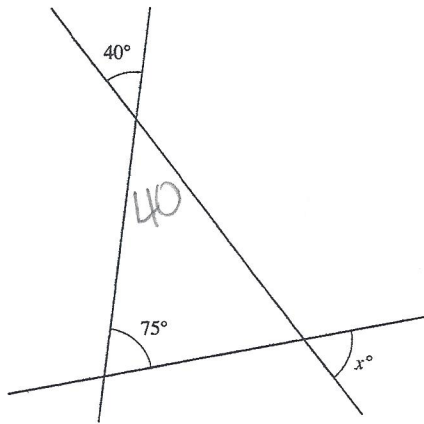


DO YOUR FIGURING HERE.

10. In the figure below, 3 lines intersect at the indicated angles.

What is the degree measure of $\angle x$?

- F. 35°
- G. 52.5°
- H. 65°
- J. 70°
- K. 75°



11. Find two arithmetic means between 11 and 26 such that the difference between consecutive numbers is the same:

11, , , 26

- A. 14, 18
- B. 15, 20
- C. 16, 21
- D. 17, 23
- E. 18, 24

$$\frac{26-11}{3} = 5$$

12. For all real numbers x and y , $(2x + 3y)^2 = ?$

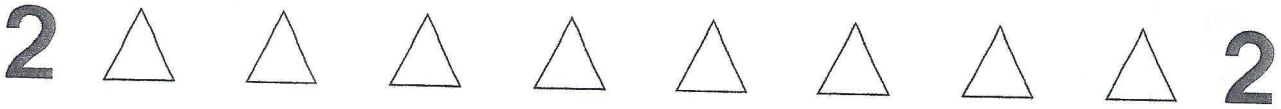
- F. $6x^2y^2$
- G. $4x^2 + 6y^2$
- H. $4x^2 + 9y^2$
- J. $4x^2 + 6xy + 6y^2$
- K. $4x^2 + 12xy + 9y^2$

$$4x^2 + 12xy + 9y^2$$

13. In a certain town in New Hampshire, there are 7,695 registered voters, 60% of whom are Democrats. How many of the town's registered voters are Democrats?

- A. 513
- B. 2,565
- C. 3,078
- D. 4,617
- E. 7,695

$$.6(7695)$$



DO YOUR FIGURING HERE.

14. Which of the following lines has the same graph as the line $2x - y = 12$?

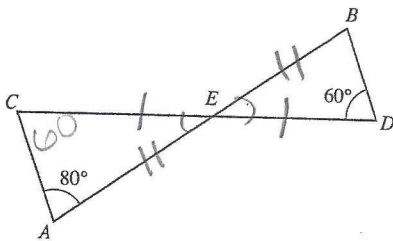
- F. $6x + 3y = 36$
- G. $4x + 2y = 24$
- H. $4x - 2y = 12$
- J. $4x - 4y = 24$
- K. $-6x + 3y = -36$

15. When $\frac{1}{3}w + \frac{2}{5}w = 1$, what is the value of w ?

- A. $\frac{1}{11}$
- B. $\frac{3}{8}$
- C. $\frac{11}{15}$
- D. $\frac{15}{11}$
- E. $\frac{8}{3}$

$\frac{5+6}{15} w = 1$
 $\frac{11}{15} w = 1$

16. In the figure below, \overline{AB} and \overline{CD} bisect each other at E . The measure of $\angle CAE$ is 80° and the measure of $\angle BDE$ is 60° . What is the measure of $\angle CEA$?

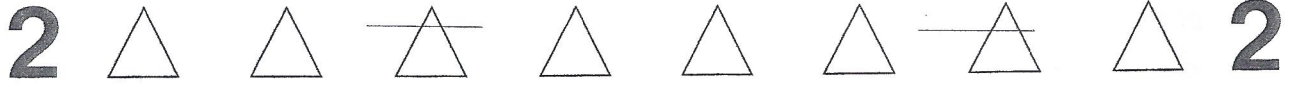


- F. 10°
- G. 30°
- H. 40°
- J. 60°
- K. Cannot be determined

17. Given that $A = (3, 2)$ and $B = (15, 8)$ in the standard (x, y) coordinate plane, what is the distance from A to B ?

- A. $5\sqrt{2}$
- B. 8
- C. $4\sqrt{10}$
- D. $6\sqrt{5}$
- E. 18

$\sqrt{12^2 + 6^2}$
 $\sqrt{144 + 36}$
 $6\sqrt{5}$



DO YOUR FIGURING HERE.

18. For all real numbers a , b , and c such that $a < b$ and $c > 0$, which of the following inequalities, if any, must be true?

- F. $a < c$
- G. $b < c$
- H. $a > c$
- J. $b > c$
- K. None of the above inequalities must be true.

19. A deli offers 4 types of sandwich meat, 3 kinds of cheese, and 5 bread varieties. When you order a sandwich at the deli, you are allowed to choose 1 meat, 1 cheese, and 1 type of bread. How many different sandwich combinations are possible at the deli?

- A. 3
- B. 12
- C. 15
- D. 30
- E. 60

20. At a certain company, 240 of the employees are women and the remaining 160 are men. What percentage of the company's workers are women?

- F. 25%
- G. $33\frac{1}{3}\%$
- H. 40%
- J. 60%
- K. $66\frac{2}{3}\%$

21. Alana leaves home to drive to college. She drives 200 miles in 4 hours before stopping for gas. She then drives 10 miles per hour faster than she did on the first part of her trip, and arrives at her dorm in 3 hours. How many miles did she drive in total?

- A. 200
- B. 300
- C. 350
- D. 380
- E. 430

22. If the monthly payment, M dollars, on a house that costs P dollars is given by the formula

$M = \frac{P}{200} - .0008P + 40$, what is the monthly payment, to the nearest dollar, on a house that costs \$200,000?

- F. \$868
- G. \$880
- H. \$960
- J. \$1,060
- K. \$1,200

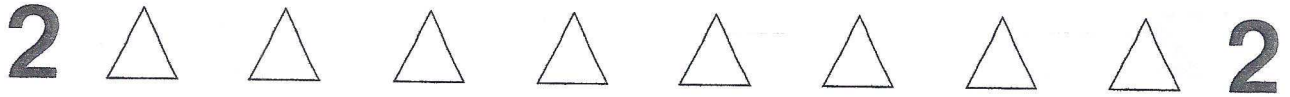
$4 \times 3 \times 5$

$\frac{240}{400} = \frac{3}{5}$

$R T = D$
 $50 \ 4 \ 200$
 $60 \ 3 \ 180$

$\frac{200,000}{200} - .0008(200,000) + 40$

$1000 - 160 + 40$



DO YOUR FIGURING HERE.

23. What is the sum of the prime factors of the number 330?

- A. 6
- B. 19
- C. 21
- D. 22
- E. 43

Handwritten work for Question 23:

$$330 \begin{matrix} \nearrow \\ \searrow \end{matrix} \begin{matrix} 33 & 10 \\ \nearrow & \searrow \end{matrix} \begin{matrix} 3 & 11 & 2 & 5 \end{matrix}$$

24. In the standard (x, y) coordinate plane, a line passes through the points $(1, -2)$ and $(5, 10)$. At which of the following points does the line cross the y -axis?

- F. $(-8, 0)$
- G. $(-5, 0)$
- H. $(0, 0)$
- J. $(0, -5)$
- K. $(0, -8)$

Handwritten work for Question 24:

$$m = \frac{12}{4} = 3$$

$$y = 3x + b$$

$$-2 = 3 + b$$

25. For all positive $a, b,$ and $c,$ $\frac{2^{-1}a^{-3}b^7c^2}{(5a)^2b^{-1}c^7} = ?$

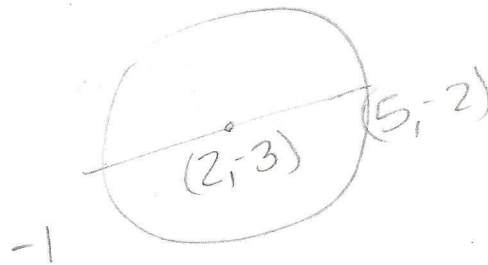
- A. $\frac{2b^6}{5a^2c^5}$
- B. $\frac{2b^8c^9}{2a^5}$
- C. $\frac{2b^8c^9}{25a^5}$
- D. $\frac{b^8}{10a^5c^5}$
- E. $\frac{b^8}{50a^5c^5}$

Handwritten work for Question 25:

$$\frac{a^{-3}b^8}{50a^2c^5}$$

26. One endpoint of a diameter of a circle with center $(2, -3)$ has coordinates at $(5, -2)$ in the standard (x, y) plane. What are the coordinates of the other endpoint of the diameter?

- F. $(2 - \sqrt{10}, -3 - \sqrt{10})$
- G. $(-1, -4)$
- H. $(0, -4)$
- J. $(2 + \sqrt{10}, -3 + \sqrt{10})$
- K. $(8, -1)$



27. Payton ran $1\frac{2}{3}$ miles on Monday, $2\frac{1}{5}$ miles on Tuesday, and $1\frac{7}{8}$ miles on Wednesday. What is the median distance that he ran?

- A. 7.200 miles
- B. 5.742 miles
- C. 1.914 miles
- D. 1.875 miles
- E. None of these.

Handwritten work for Question 27:

$$1\frac{2}{3}$$

$$2\frac{1}{5}$$

$$1\frac{7}{8}$$



DO YOUR FIGURING HERE.

28. If $6x^2 + x - c = (cx - 1)(3x + 2)$, what is the value of c ?

- F. -2
- G. -1
- H. 2
- J. 3
- K. 6

29. What is the y -coordinate of the point of intersection of the lines $y = 3x - 7$ and $y = 5x + 5$ in the standard (x, y) coordinate plane?

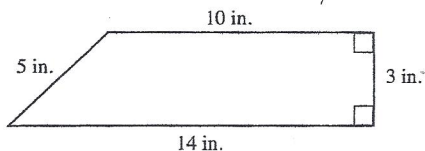
- A. -25
- B. -11
- C. -6
- D. 6
- E. 11

$$3x - 7 = 5x + 5$$

$$-12 = 2x$$

$$x = -6$$

30. What is the area, in square inches, of the figure shown below?



- F. 24
- G. 32
- H. 36
- J. 42
- K. 72

$$A = \frac{1}{2} h (b_1 + b_2)$$

$$\frac{1}{2} (3) (10 + 14)$$

$$\frac{1}{2} (3) 24$$

$$3 \cdot 12$$

31. What is the solution set for the inequality $6 - 4(x - 2) > 4x + 5$?

- A. $x < -\frac{7}{8}$
- B. $x < -\frac{1}{4}$
- C. $x < \frac{9}{8}$
- D. $x > -\frac{7}{8}$
- E. $x > \frac{9}{8}$

$$6 - 4x + 8 > 4x + 5$$

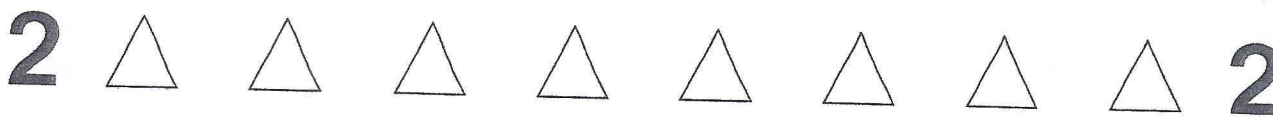
$$9 > 8x$$

32. For the circle whose standard equation is $(x - 1)^2 + (y + 2)^2 = 8$, the center and radius are:

- F. center = $(-1, 2)$; radius = $2\sqrt{2}$.
- G. center = $(-1, 2)$; radius = 4.
- H. center = $(0, 0)$; radius = 4.
- J. center = $(1, -2)$; radius = $2\sqrt{2}$.
- K. center = $(1, -2)$; radius = 4.

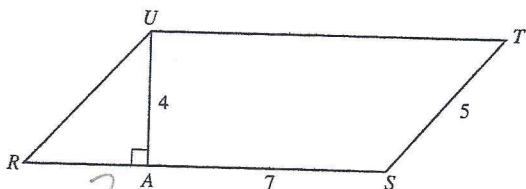
$$(1, -2)$$

Practice Test 2



DO YOUR FIGURING HERE.

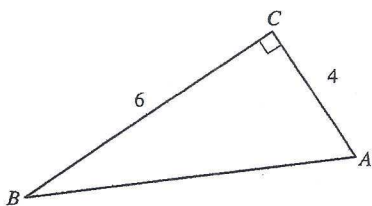
33. Parallelogram $RSTU$ is shown below, with $\overline{UA} = 4$ inches, $\overline{AS} = 7$ inches, and $\overline{ST} = 5$ inches. What is the area of $RSTU$ in square inches?



$A = bh$

- A. 16
- B. 20
- C. 28
- D. 35
- E. 40

34. If the lengths of the sides of the triangle below are shown in inches, how many inches long is side \overline{AB} ?



$\sqrt{6^2 + 4^2}$
 $\frac{36}{16}$
 $\sqrt{52}$

- F. $2\sqrt{13}$
- G. 10
- H. $4\sqrt{13}$
- J. 26
- K. 42

35. Which of the following is the equation for a circle with diameter \overline{AB} , given that $A = (4, 2)$ and $B = (8, -4)$?

- A. $x^2 + y^2 = 13$
- B. $x^2 + y^2 = 26$
- C. $(x - 6)^2 + (y + 1)^2 = 13$
- D. $(x + 6)^2 + (y - 1)^2 = 13$
- E. $(x - 6)^2 + (y + 1)^2 = 26$

$C = (6, -1)$
 $\sqrt{\frac{(6-4)^2 + (-2+1)^2}{2}}$
 $\sqrt{\frac{2^2 + 1^2}{2}}$

36. Which of the following comprises all of the values of x for which $\frac{2}{3}x - \frac{1}{2} < \frac{1}{2}x + \frac{2}{3}$?

- F. $x < 1$
- G. $x < \frac{7}{6}$
- H. $x < 7$
- J. $x > \frac{7}{3}$
- K. $x > 7$

$\frac{1}{6}x < \frac{7}{6}$
 $x < 7$

Practice Test 2

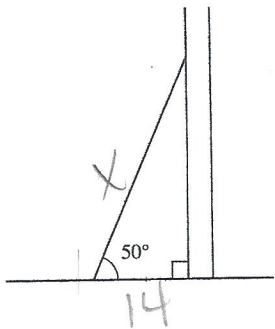
2



2

DO YOUR FIGURING HERE.

37. A guide wire for a telephone tower makes an angle of 50° with the level ground and is 14 meters from the base of the tower. How many meters long is the guide wire?



$$\cos 50 = \frac{14}{X}$$

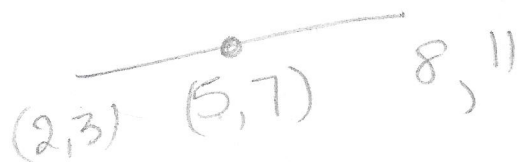
- A. 3.80
- B. 13.50
- C. 16.68
- D. 21.78
- E. 22.58

38. For all $x^2 \neq 9$, $\frac{(x-3)^2}{x^2-9}$ is equivalent to:

$$\frac{(x-3)(x-3)}{(x-3)(x+3)}$$

- F. -1
- G. $\frac{1}{2}$
- H. 1
- J. $\frac{1}{x+3}$
- K. $\frac{x-3}{x+3}$

39. In the standard (x, y) coordinate plane, the midpoint of \overline{AB} is $(5, 7)$ and A is located at $(2, 3)$. If the coordinates of B are (x, y) , what is the value of $(x + y)$?

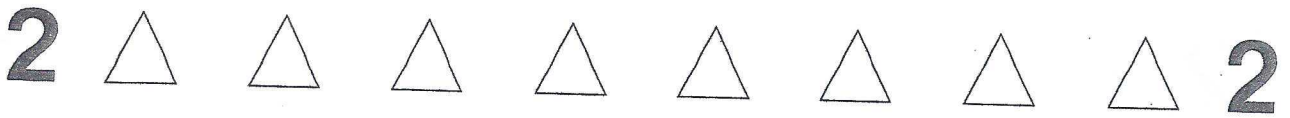


- A. 19
- B. 17
- C. 11
- D. 8.5
- E. 8

40. If the solutions to the equation $(x + a)(x + b) = 0$ are $x = 8$ and $x = -\frac{3}{2}$, then $a + b = ?$

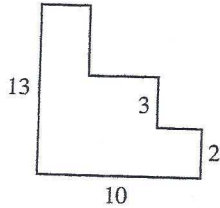
$$(x-8)(x+\frac{3}{2})$$

- F. -13
- G. -12
- H. -6.5
- J. 6.5
- K. 12



DO YOUR FIGURING HERE.

41. In the figure below, all line segments intersect at right angles, and all measurements are given in inches. What is the perimeter of the figure in inches?



$$\begin{array}{r} 13 \\ 23 \\ \hline \times 2 \end{array}$$

- A. 23
 - B. 28
 - C. 46
 - D. 130
 - E. Cannot be determined
42. If $\cot \theta = P$, which of the following expressions must also equal P ?
- F. $\tan \theta$
 - G. $\csc \theta - 1$
 - H. $\sin \theta - \cos \theta$
 - J. $\frac{\sin \theta}{\cos \theta}$
 - K. $\frac{\cos \theta}{\sin \theta}$
43. A line in the standard (x, y) coordinate plane contains the points $(5, 9)$ and $(8, 3)$. What is the x -intercept of this line?

$$\frac{6}{-3}$$

$$y = -2x + b$$

$$y = -2x + 19$$

- A. 19
 - B. $\frac{19}{2}$
 - C. 0
 - D. -2
 - E. $-\frac{19}{2}$
44. Each side of a given cube is a square with an area of 729 square inches. What is the volume of the cube in cubic inches?

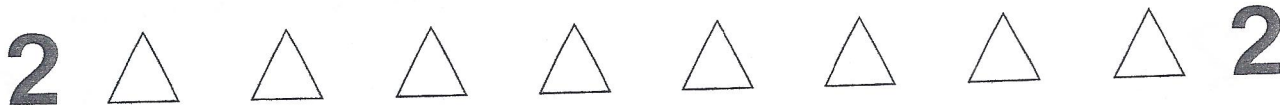
$$3^3 \sqrt{729}$$

$$\sqrt{729}$$

$$(3^3)^3$$

- F. 3^3
- G. 3^9
- H. 3^{12}
- J. 3^{18}
- K. 3^{64}

Practice Test 2



DO YOUR FIGURING HERE.

45. If p and q are positive integers, and $6pq^4$ and $12p^2q^2$ have a greatest common factor of 1,050, then which of the following is a possible value for the sum of p and q ?

- A. 6
- B. 8
- C. 12
- D. 35
- E. 42

Handwritten work for Question 45:

$$6pq^4 = 1050$$

$$pq^2 = 175$$

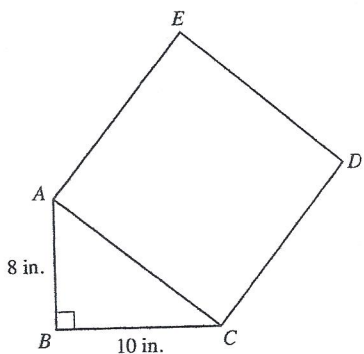
^

25 7

^

5 5

46. In the figure shown below, $\triangle ABC$ is a right triangle, \overline{AB} is 8 inches long, and \overline{BC} is 10 inches long. What is the area, in square inches, of square $ACDE$?



- F. $2\sqrt{41}$
- G. $\sqrt{164}$
- H. 36
- J. $8\sqrt{41}$
- K. 164

Handwritten work for Question 46:

$$10^2 + 8^2$$

$$100 + 64$$

47. In the standard coordinate plane, what is the distance between the points (5, 7) and (13, 11)?

- A. 80
- B. 12
- C. $\sqrt{80}$
- D. 8
- E. $\sqrt{8}$

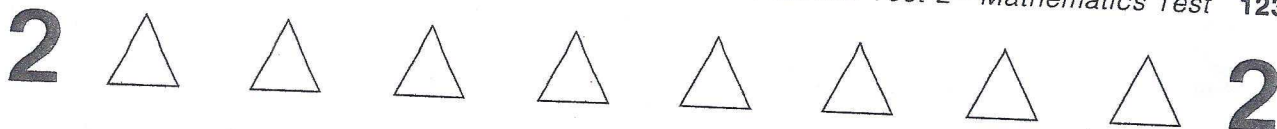
Handwritten work for Question 47:

$$\sqrt{8^2 + 4^2}$$

$$\sqrt{64 + 16}$$

48. What value must be added to $9x^2 - 30x$ in order to complete the square (that is, make it a perfect square trinomial)?

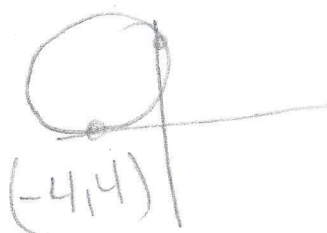
- F. -5
- G. 5
- H. 9
- J. 25
- K. 45



DO YOUR FIGURING HERE.

49. A circle in the standard (x, y) coordinate plane is tangent to the x -axis at $-a$, and tangent to the y -axis at a , with $a > 0$. The radius of the circle is 4 units. What is the equation of the circle?

- A. $x^2 + y^2 = 4$
- B. $x^2 + y^2 = 16$
- C. $(x - 4)^2 + (y - 4)^2 = 4$
- D. $(x + 4)^2 + (y + 4)^2 = 16$
- E. $(x + 4)^2 + (y - 4)^2 = 16$



50. Compared to the graph of $y = \sin x$, the graph of $y = 2 \sin(4x)$ has:

- F. 8 times the amplitude and the same period.
- G. 2 times the amplitude and 4 times the period.
- H. 2 times the amplitude and $\frac{1}{4}$ the period.
- J. $\frac{1}{2}$ the amplitude and 4 times the period.
- K. $\frac{1}{2}$ the amplitude and $\frac{1}{4}$ the period.

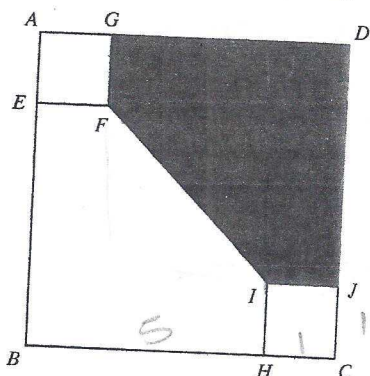
51. Which of the following is the solution set for x such that $3x - 9 \geq -3(9 - x)$?

- A. The empty set
- B. The set containing only zero
- C. The set of negative numbers
- D. The set of positive numbers
- E. The set of real numbers

$$3x - 9 \geq 3x - 27$$

$$-9 \geq -27$$

52. In the figure below, square $ABCD$ has a side length of 6 inches, and squares $AEFG$ and $CHIJ$ each have a side length of 1 inch. What is the area, in square inches, of the shaded pentagon $DGFIJ$?



- F. 9
- G. 12.5
- H. 17
- J. 18
- K. 20.5

$$25 - \frac{42}{2}$$

$$25 - 8$$

2



2

DO YOUR FIGURING HERE.

53. Let the operation # be defined for the set of real numbers by:

$$x \# y = \frac{x + y}{3}$$

Which of the following statements are true for all real numbers x , y , and z ?

- I. $x \# y = y \# x$
- II. $(x \# y) \# z = x \# (y \# z)$
- III. $0 \# x = 0$

- A. I only
- B. II only
- C. III only
- D. I and III only
- E. II and III only

54. If $x^2 - 36a^2 = 5ax$, what are the two solutions for x in terms of a ?

- F. $-4a$ and $-9a$
- G. $-4a$ and $9a$
- H. $-3a$ and $12a$
- J. $3a$ and $-12a$
- K. $4a$ and $-9a$

$$x^2 - 5ax - 36a^2 = 0$$

$$(x + 4a)(x - 9a)$$

$$x = -4a, 9a$$

55. For all values of θ over which $\sin \theta$ and $\cos \theta$ are nonzero, $\frac{\sqrt{1 - \cos^2 \theta}}{\sin^2 \theta} \cdot \cos \theta = ?$

- A. 1
- B. $\tan \theta$
- C. $\cot \theta$
- D. $\sec \theta$
- E. $\csc \theta$

$$\frac{\sqrt{\sin^2 \theta}}{\sin^2 \theta} \cdot \cos \theta = \frac{\cos \theta}{\sin \theta}$$

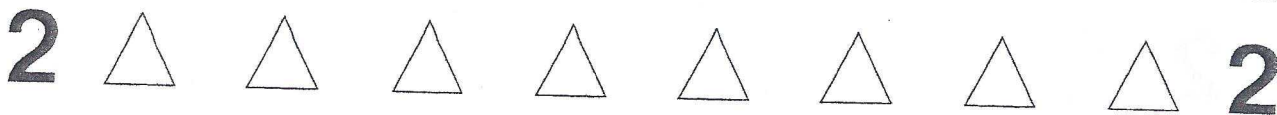
56. For values of x where $\csc x$, $\sec x$, and $\tan x$ are all defined, $(\csc x) \cdot (\sec x) \cdot (\tan x) = ?$

- F. $\sec^2 x$
- G. $\csc^2 x$
- H. $\tan^2 x$
- J. 1
- K. -1

$$\frac{1}{\cancel{\sin x}} \cdot \frac{1}{\cos x} \cdot \frac{\cancel{\sin x}}{\cos x} = \frac{1}{\cos^2 x}$$

57. What is the solution set for the equation $| -x | = x$?

- A. All real numbers
- B. $x \geq 0$
- C. $x \leq 0$
- D. Only $x = 0$
- E. Only $x = -1$



DO YOUR FIGURING HERE.

58. For which of the following values of a will there be exactly one real solution to the equation $2x^2 - ax + 8 = 0$?

- F. $2\sqrt{3}$
- G. 4
- H. $4\sqrt{3}$
- J. 6
- K. 8**

$$a^2 - 4(2)(8) = 0$$

59. If $x = 3t + 4$ and $y = 5 - t$, then which of the following equations expresses y in terms of x ?

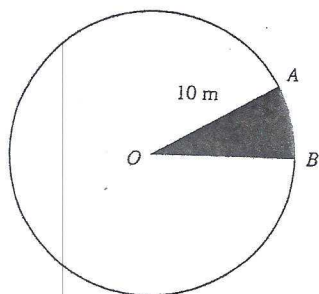
- A. $y = \frac{19-x}{3}$**
- B. $y = \frac{1-x}{3}$
- C. $y = 9 - x$
- D. $y = x + 9$
- E. $y = x - 1$

$$\frac{x-4}{3} = t$$

$$5 - \frac{x-4}{3}$$

$$\frac{15 - x + 4}{3}$$

60. In the circle below, radius \overline{OA} has a length of 10 meters, and central angle $\angle AOB$ measures 30° . What is the area, in square meters, of shaded sector AOB ?



- F. $\frac{5\pi}{6}$
- G. $\frac{5\pi}{3}$
- H. $\frac{10\pi}{3}$
- J. $\frac{25\pi}{6}$
- K. $\frac{25\pi}{3}$**

$$\frac{30}{360} \pi (10)^2$$

$$\frac{\pi}{12} (1000)$$



If there is still time remaining, check your answers to this section.

Practice Test 2

Answer Key

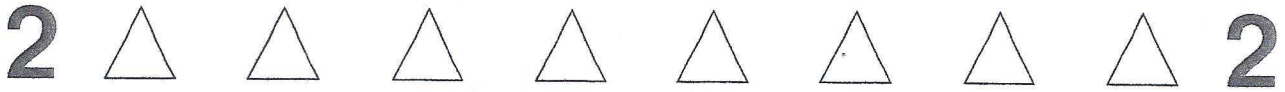
PRACTICE TEST 2

English Test

1. A	16. F	31. D	46. F	61. C
2. G	17. C	32. G	47. C	62. G
3. C	18. F	33. A	48. F	63. B
4. G	19. D	34. G	49. A	64. G
5. C	20. G	35. D	50. J	65. A
6. J	21. A	36. F	51. D	66. J
7. A	22. J	37. B	52. H	67. B
8. H	23. C	38. H	53. B	68. F
9. A	24. H	39. B	54. J	69. B
10. J	25. A	40. J	55. B	70. F
11. D	26. F	41. C	56. G	71. B
12. H	27. B	42. F	57. A	72. G
13. C	28. J	43. A	58. H	73. D
14. G	29. A	44. G	59. B	74. H
15. C	30. J	45. B	60. J	75. D

Math Test

1. A	13. D	25. E	37. D	49. E
2. G	14. K	26. G	38. K	50. H
3. B	15. D	27. D	39. A	51. E
4. J	16. H	28. H	40. H	52. H
5. E	17. D	29. A	41. C	53. A
6. F	18. K	30. H	42. K	54. G
7. C	19. E	31. C	43. B	55. C
8. H	20. J	32. J	44. G	56. F
9. C	21. D	33. E	45. C	57. B
10. H	22. G	34. F	46. K	58. K
11. C	23. C	35. C	47. C	59. A
12. K	24. J	36. H	48. J	60. K

**MATHEMATICS TEST**

60 MINUTES—60 QUESTIONS

Directions: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

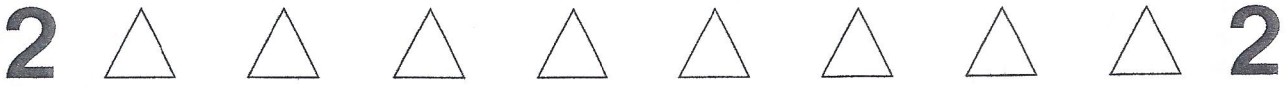
Note: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

DO YOUR FIGURING HERE.

1. If $3x - 5 = 7$, then $3x = ?$
 - A. $\frac{2}{3}$
 - B. $\frac{4}{3}$
 - C. 4
 - D. $\frac{22}{3}$
 - E. 12
2. What is the complement of 70° ?
 - F. 10°
 - G. 20°
 - H. 30°
 - J. 80°
 - K. 110°
3. 70 is 10% of what number?
 - A. 7
 - B. 63
 - C. 77
 - D. 700
 - E. 7,000

GO ON TO THE NEXT PAGE.



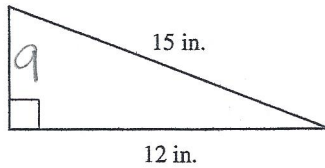
DO YOUR FIGURING HERE.

4. The sum of three consecutive integers is 99. What is the value of the greatest of the three integers?

- F. 32
- G. 33
- H. 34
- J. 35
- K. 36

5. What is the area of the figure below?

- A. 54 in²
- B. 90 in²
- C. 108 in²
- D. 135 in²
- E. 180 in²



$$\frac{9 \times 12}{2}$$

6. Last week Dyson earned \$8 per hour working at the local grocery store. This week his boss gave him a 10% raise. If he works 20 hours this week, what will his gross income be before taxes?

- F. \$160
- G. \$162
- H. \$174
- J. \$176
- K. \$180

$$8.8(20) = 176$$

7. Which of the following inequalities is equivalent to $3 - 4(x + 7) < 19$?

- A. $x > \frac{9}{2}$
- B. $x < \frac{9}{2}$
- C. $x < -11$
- D. $x > -11$
- E. $x < 11$

$$\begin{aligned} 3 - 4x - 28 &< 19 \\ -25 - 4x &< 19 \\ -4x &< 44 \\ x &> 11 \end{aligned}$$

8. Which of the following is equivalent to $3\sqrt{300} - 5\sqrt{75}$?

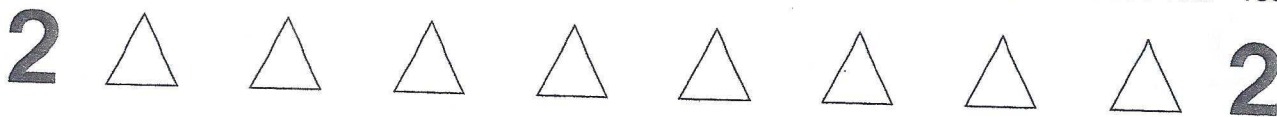
- F. $-2\sqrt{225}$
- G. $5\sqrt{3}$
- H. $15\sqrt{3}$
- J. $2\sqrt{225}$
- K. $15\sqrt{225}$

$$\begin{aligned} 3(10\sqrt{3}) - 5(5\sqrt{3}) \\ 30\sqrt{3} - 25\sqrt{3} \\ 5\sqrt{3} \end{aligned}$$

9. $|-2 + 3^2| - |-2 - 3^2| = ?$

- A. -24
- B. -4
- C. 0
- D. 18
- E. 26

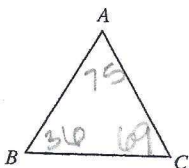
$$\begin{aligned} |7| - |-11| \\ -4 \end{aligned}$$



DO YOUR FIGURING HERE.

10. For triangle ABC , $m\angle A = 75^\circ$ and $m\angle B = 36^\circ$.
Which segment of triangle ABC is the longest?

- F. AB
 G. BC
 H. AC
 J. AB and AC are both the longest sides.
 K. Not enough information



11. Which of the following is a factor of $3x^2 + x - 4$?

- A. $(x + 2)$
 B. $(x - 2)$
 C. $(3x - 4)$
 D. $(x + 1)$
 E. $(x - 1)$

$$3x^2 + x - 4$$

$$(3x + 4)(x - 1)$$

12. Which of the following equations passes through the point $(-3, 5)$?

- F. $y = -2x - 3$
 G. $y = -4x + 5$
 H. $y = -x + 2$
 J. $y = 4x + 5$
 K. $y = 5x + 9$

13. If $f(x) = \frac{-x^2 + 4}{x}$, then $f(-2) = ?$

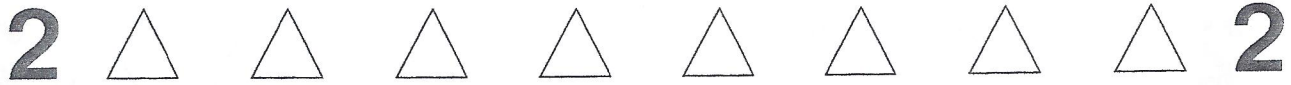
- A. -4
 B. -1
 C. 0
 D. 6
 E. 10

$$f(-2) = \frac{-(-2)^2 + 4}{-2}$$

14. Which of the following equations is parallel to

$y = -\frac{3}{4}x + 2$ in the standard (x, y) coordinate plane?

- F. $y = -\frac{3}{4}x$
 G. $y = \frac{4}{3}x + 2$
 H. $y = -\frac{4}{3}x + 2$
 J. $y = \frac{3}{4}x + 2$
 K. $x = -\frac{3}{4}y + 2$



DO YOUR FIGURING HERE.

15. An aquarium has exactly two types of fish: goldfish and angelfish. If the ratio of goldfish to angelfish is 2:5 and there are 25 angelfish in the aquarium, how many total fish are in the aquarium?

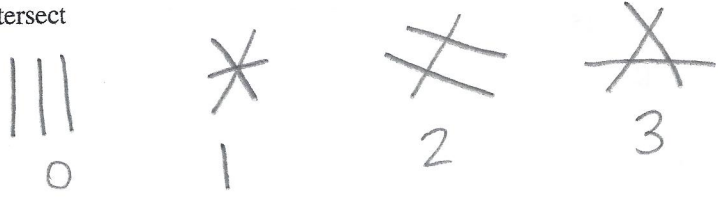
$$\frac{G}{A} = \frac{2}{5} = \frac{x}{25}$$

$$x = 10$$

$$10 + 25$$

- A. 7
- B. 32
- C. 35
- D. 50
- E. 125

16. Three different lines in the same plane can intersect at how many points?



- F. 1
- G. 1 or 2
- H. 1 or 3
- J. 1, 2, or 3
- K. 0, 1, 2, or 3

17. If $-1 < a < 0$, $-3 < b < -4$, and $c = a - b$, then which of the following statements is true?

$$-\frac{1}{2} + +3\frac{1}{2} = 3$$

- A. $c < a$
- B. $c < b$
- C. $c < a + b$
- D. $c < 0$
- E. $c > 0$

18. What is the slope between the points $(-2, 5)$ and $(0, 8)$?

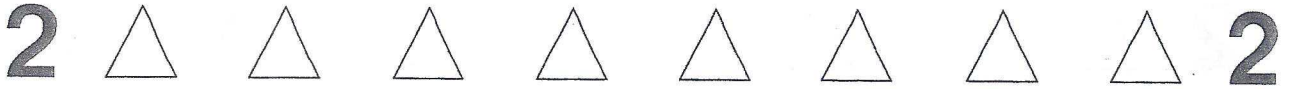
$$\frac{8-5}{0-(-2)} = \frac{3}{2}$$

- F. $-\frac{3}{2}$
- G. $-\frac{2}{3}$
- H. $\frac{7}{8}$
- J. $\frac{8}{7}$
- K. $\frac{3}{2}$

19. Rosemary and Caroline are baking cupcakes for a party. They are working from a recipe that will make 32 cupcakes. The recipe requires $2\frac{1}{2}$ cups of sugar to make 1 full batch. If they need to make 250 cupcakes for the party, which of the following amounts is the LEAST amount of sugar they need to make all 250 cupcakes?

$$\frac{2\frac{1}{2}}{32} = \frac{x}{250}$$

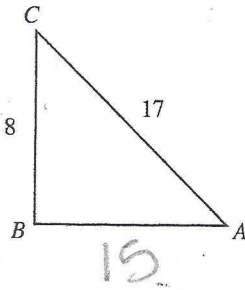
- A. 5 cups
- B. 10 cups
- C. 15 cups
- D. 20 cups
- E. 25 cups



DO YOUR FIGURING HERE.

20. For the following triangle, what is the value of $\sin(C)$?

- F. $\frac{8}{17}$
- G. $\frac{15}{17}$
- H. $\frac{\sqrt{353}}{17}$
- J. $\frac{17}{15}$
- K. $\frac{17}{8}$



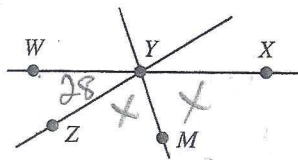
21. If $5^3 \cdot 5^{-7} = \frac{1}{5^x}$, then $x = ?$

- A. -21
- B. -4
- C. 4
- D. 7
- E. 21

$$5^{-4} = \frac{1}{5^4}$$

22. In the figure below, $m\angle WYZ = 28^\circ$ and \overline{YM} bisects $\angle ZYX$. Which of the following is the measure of $\angle XYM$?

- F. 76°
- G. 78°
- H. 84°
- J. 90°
- K. 152°

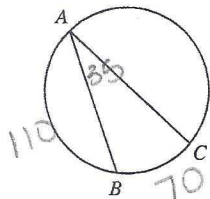


$$2x + 28 = 180$$

$$2x = 152$$

23. In the figure below, \overline{AC} is a diameter of the circle and $m\angle BAC = 35^\circ$. Find the measure of arc \overline{AB} .

- A. 35°
- B. 60°
- C. 70°
- D. 90°
- E. 110°



24. Which of the following is the greatest common factor of $36m^4n^3p^5$ and $24m^2n$?

- F. $6m^2n$
- G. $6m^4n^3p^5$
- H. $12m^2n$
- J. $12m^2np^5$
- K. $72m^2n$

$$12m^2n$$



DO YOUR FIGURING HERE.

25. Dave drove 144 miles to see his favorite band in concert. The drive to the concert took exactly 3 hours. On the drive home, Dave drove 10 miles per hour faster than he drove to the concert. Approximately how long did the return trip take?

$$R \cdot T = D$$

$$R \cdot 3 = 144$$

$$R = 48$$

$$58(T) = 144$$

- A. 2.2 hours
- B. 2.5 hours
- C. 2.7 hours
- D. 2.9 hours
- E. 3 hours

26. What value of x will satisfy the following matrix equation?

$$\begin{bmatrix} 23y^2 & 13z \\ 2x-1 & -15w^3 \end{bmatrix} + \begin{bmatrix} -7 & 10 \\ -4x-2 & 13 \end{bmatrix} = \begin{bmatrix} 16 & 23 \\ 12 & -2 \end{bmatrix}$$

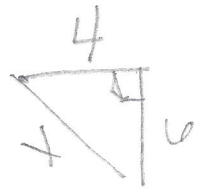
$$2x - 1 + -4x - 2 = 12$$

$$-2x - 3 = 12$$

$$-2x = 15$$

- E. -7.5
- G. -3.5
- H. 1
- J. 6.5
- K. 13

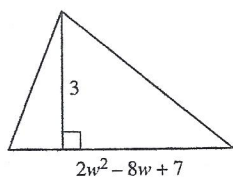
27. Paxton leaves his house at noon heading due east for 4 miles. He then turns and heads directly south for 6 miles until he reaches the marina. What is the straight-line distance from Paxton's house to the marina?



- A. $2\sqrt{2}$
- B. 7
- C. $2\sqrt{13}$
- D. 10
- E. $4\sqrt{13}$

$$\frac{16 + 36}{50}$$

28. Which of the following is an expression for the area of the triangle below?



$$\frac{6w^2 - 24w + 21}{2}$$

- F. $2w^2 - 8w + 10$
- G. $\frac{6w^2 - 24w + 21}{2}$
- H. $6w^2 - 24w + 21$
- J. $12w^2 - 48w + 42$
- K. $(2w - 7)(w + 3)$

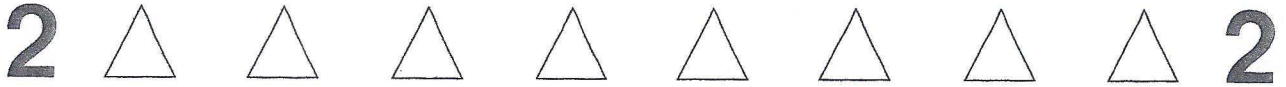
29. What is the difference in the measure of one interior angle and one exterior angle of a regular decagon?

- A. 36°
- B. 64°
- C. 108°
- D. 144°
- E. 180°

$$Ext \angle = \frac{360}{10} = 36$$

$$Int \angle = 180 - 36 = 144$$

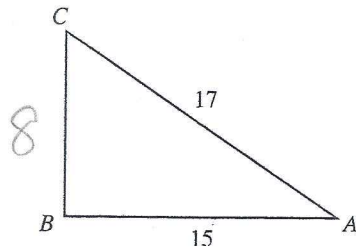
$$\frac{144}{108}$$



DO YOUR FIGURING HERE.

30. For $\triangle ABC$, what is the value of $\tan(A) - \cos(C)$?

- F. $-\frac{89}{255}$
 G. $-\frac{16}{255}$
 H. 0
 J. $\frac{16}{255}$
 K. $\frac{89}{255}$



$$\tan A - \cos C$$

$$\frac{8}{15} - \frac{8}{17}$$

31. If \forall is defined for all real numbers x and y by $x \forall y = (x + y)(x - y)$, then $1 \forall (2 \forall 2) = ?$

- A. 0
 B. 1
 C. 3
 D. 4
 E. 5

$$x \forall y = (x+y)(x-y)$$

$$2 \forall 2 = (2+2)(2-2) = 0$$

$$1 \forall 0 = (1+0)(1-0)$$

32. Sophie has played 6 games of soccer scoring 0, 1, 3, 2, 4, and 1 goals respectively in those games. For game 7, which of the following values will NOT yield a median of 2 goals scored?

- F. 1 goal
 G. 2 goals
 H. 3 goals
 J. 4 goals
 K. 5 goals

0, 1, 1, 2, 3, 4.

33. What is the center of the circle with equation $(x + 7)^2 + (y - 5)^2 = 121$?

- A. $(-7, -5)$
 B. $(-7, 5)$
 C. $(7, -5)$
 D. $(7, 5)$
 E. $(5, 11)$

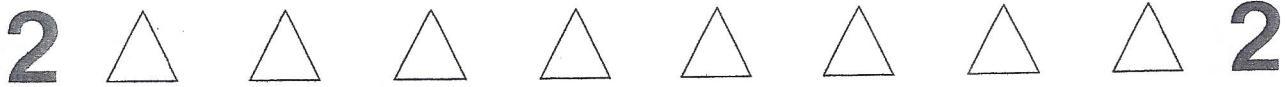
-7, 5

34. Given the equation $3x - 7y = 21$, what is the equation in slope-intercept form?

- F. $y = -\frac{3}{7}x + 3$
 G. $y = -\frac{7}{3}x + 3$
 H. $y = -\frac{3}{7}x - 3$
 J. $y = \frac{3}{7}x + 3$
 K. $y = \frac{3}{7}x - 3$

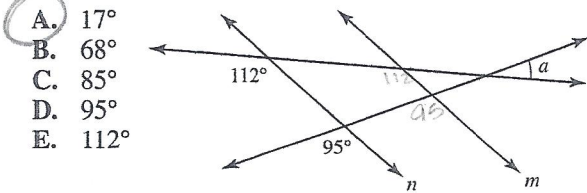
$$-7y = -3x + 21$$

$$y = \frac{3}{7}x - 3$$

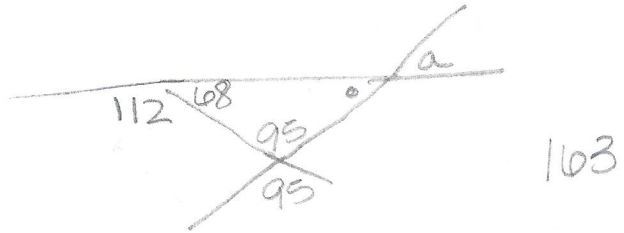


DO YOUR FIGURING HERE.

35. In the graph below, line m is parallel to line n . Find the value of a .



- A. 17°
- B. 68°
- C. 85°
- D. 95°
- E. 112°



36. Which of the following is the set of solutions to the inequality $-\frac{2}{3}x + 5 < -\frac{1}{3}(2x + 9)$?

- F. $x < 6$
- G. $x > -6$
- H. $x > 6$
- J. There is no solution.
- K. The set of all real numbers

$$-\frac{2}{3}x + 5 < -\frac{1}{3}(2x + 9)$$

$$5 < -3$$

37. Given the equation $-\frac{3}{5}x + 6y = 18$, which of the following equations is perpendicular to the given equation?

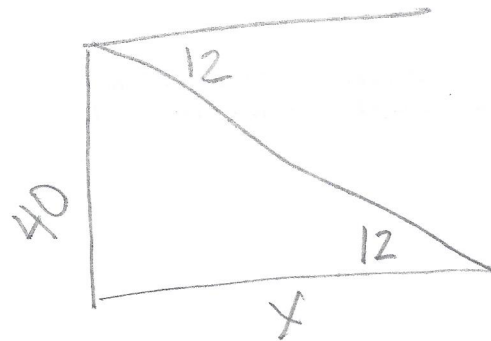
- A. $y = \frac{1}{10}x + 2$
- B. $y = \frac{5}{3}x + 7$
- C. $y = \frac{3}{5}x + 5$
- D. $y = -10x + 1$
- E. $y = 10x + 18$

$$\frac{3}{5} \cdot \frac{1}{6} = \frac{1}{10}$$

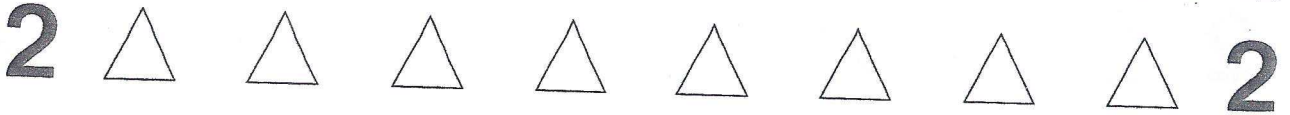
⊥ slope = -10

38. Dustin is in a 40-foot air traffic control tower at the local airport. He spots a plane that has just landed and using his protractor measures the angle of depression from the top of the tower to the landed plane to be 12° . How far from the base of the control tower is the plane?

- F. $\frac{\tan(12^\circ)}{40}$
- G. $\frac{40}{\tan(12^\circ)}$
- H. $\frac{\sin(12^\circ)}{40}$
- J. $\frac{40}{\sin(12^\circ)}$
- K. $\frac{\cos(12^\circ)}{40}$



$$\tan 12 = \frac{40}{x}$$



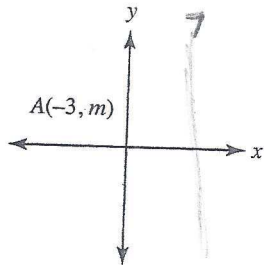
DO YOUR FIGURING HERE.

39. For what values of x is the function $\sqrt{x-5}$ undefined in the real number system?

- A. $x = 0$
- B. $x = 5$
- C. $x = -5$
- D. $x < 5$
- E. $x > 5$

$x - 5 < 0$
 $x < 5$

40. In the standard (x, y) coordinate plane, what are the coordinates of point A after the graph is reflected over the line $x = 7$?



- F. $(3, m)$
- G. $(-3, -m)$
- H. $(10, m)$
- J. $(15, m)$
- K. $(17, m)$

41. Given line segment AB with $A(-3, 2)$ and $B(5, 8)$, which of the following is the length of AB ?

- A. $\sqrt{34}$
- B. $2\sqrt{10}$
- C. 10
- D. $9\sqrt{2}$
- E. $\sqrt{170}$

$d = \sqrt{(5+3)^2 + (8-2)^2}$
 $\sqrt{8^2 + 6^2}$

42. Given similar rectangles $QUAD$ and $RECT$, the ratio of sides QU to RE is 1:4. If the area of $QUAD$ is 12, what is the area of $RECT$?

- F. 0.75
- G. 3
- H. 12
- J. 48
- K. 192

$\frac{1}{16} = \frac{12}{x}$

2



2

DO YOUR FIGURING HERE.

Use the following table to answer questions 43–44.

Forty students were asked to name their favorite pet. The following table lists the results.

Dog	16
Cat	15
Bird	9

43. Erick wants to make a circle graph from the given information. What would be the central angle for the dog piece of the graph?

A. 16°
 B. 135°
 C. 144°
 D. 154°
 E. 180°

$$\frac{16}{40} = \frac{x}{360}$$

44. When Erick recounted the votes later, he realized 3 of the votes that had actually been cast for cats got recorded as votes for dogs. What is the difference between the original percent of votes cast for cats and the corrected percent of votes for cats?

F. 2.5%
 G. 7.5%
 H. 15%
 J. 37.5%
 K. 45%

$$\frac{18}{40} - \frac{15}{40} = \frac{3}{40}$$

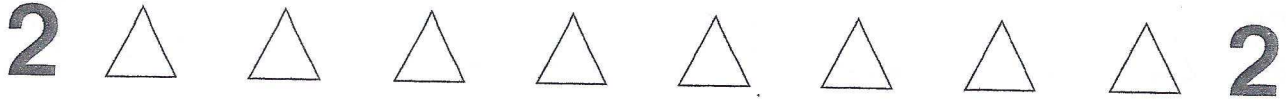
45. A parking lot downtown charges x dollars for the first hour and y dollars for each hour after the first. If Daniel parks in the lot for h hours where $h > 6$, which of the following equations represents P , the amount Daniel has to pay to park in the lot?

A. $P = h(x + y)$
 B. $P = x + yh$
 C. $P = y + x(h - 1)$
 D. $P = xh + y(h - 1)$
 E. $P = x + y(h - 1)$

$$P = (h-1)y + x$$

46. Let $y = \frac{2x}{3z}$. What happens to the value of z as both x and y are doubled?

F. z remains the same
 G. z doubles
 H. z decreases by $\frac{1}{2}$
 J. z quadruples
 K. z decreases by a factor of $\frac{1}{4}$



DO YOUR FIGURING HERE.

47. If $\frac{w^6 t^5}{m^9} > 0$, then which of the following is true?

- A. $w > 0$
- B. $t > 0$
- C. $m > 0$
- D. $wt > 0$
- E. $tm > 0$

*W⁶ = Pos
t & m have
same sign*

48. Which of the following is equivalent to

$$2\log(x) + \frac{1}{2}\log(y) - 4\log(z)?$$

- F. $\log(2x + \frac{1}{2}y - 4z)$
- G. $\log(x^2 z^4 \sqrt{y})$
- H. $\log\left(\frac{x^2 \sqrt{y}}{z^4}\right)$
- J. $\log\left(\frac{xy}{4z}\right)$
- K. $\log(2x^2 yz)$

log $\frac{x^2 \sqrt{y}}{z^4}$

49. Given the following table, find $f(g(2))$:

x	$f(x)$	$g(x)$
1	-5	0
2	-10	3
3	-15	6
4	-20	9

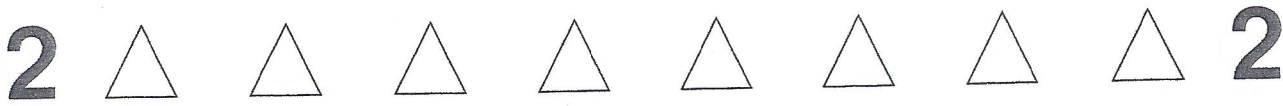
- A. -15
- B. -10
- C. 0
- D. 3
- E. 6

*f(g(2))
f(3) = -15*

50. The number of fish, p , a small pond can sustain varies inversely with the square root of the amount of predators, q , in the pond. If a pond with 49 predators can sustain a population of 800 fish, how many fish could a pond with 100 predators sustain?

- F. 560
- G. 600
- H. 650
- J. 1,600
- K. 2,000

*P = $\frac{k}{\sqrt{q}}$
800 = $\frac{k}{\sqrt{49}}$
k = 5600
P = $\frac{5600}{\sqrt{q}}$*



DO YOUR FIGURING HERE.

51. Points $P(1, 1)$ and $Q(x, x^2)$ lie in the standard (x, y) coordinate plane. Which of the following is an expression for the slope between points P and Q when $x > 5$?

- A. 0
- B. $\frac{x^2+1}{x+1}$
- C. $x+1$
- D. $\frac{x+1}{x^2+1}$
- E. Undefined

$$\frac{x^2-1}{x-1} = \frac{(x-1)(x+1)}{x-1}$$

52. Which of the following expressions is equivalent to

$$\frac{3 \cdot 3^{2x-5}}{3^{x+1}}?$$

- F. 3^{x-7}
- G. 3^{x-5}
- H. 3^{x-3}
- J. 3^{x-1}
- K. 1

$$\frac{3^{2x-4}}{3^{x+1}} = 3^{(2x-4)-(x+1)} = 3^{x-5}$$

53. What fraction is located exactly halfway between

$\frac{3}{8}$ and $\frac{4}{5}$ on the standard number line?

- A. $\frac{15}{40}$
- B. $\frac{17}{40}$
- C. $\frac{1}{2}$
- D. $\frac{7}{13}$
- E. $\frac{47}{80}$

Find Ave

$$\frac{15 + 32}{40} = \frac{47}{40} \div 2$$

54. Mike has taken 4 tests in algebra so far. His average after 4 tests is 85%. If he has not received a grade lower than 80% on any tests, what is the highest possible score Mike could have achieved on one test?

- F. 96%
- G. 97%
- H. 98%
- J. 99%
- K. 100%

$$\text{Ave} = \frac{\text{Sum}}{\#}$$

$$85 = \frac{\text{Sum}}{4}$$

$$340 = \text{Sum}$$

3 tests of 80 = 240

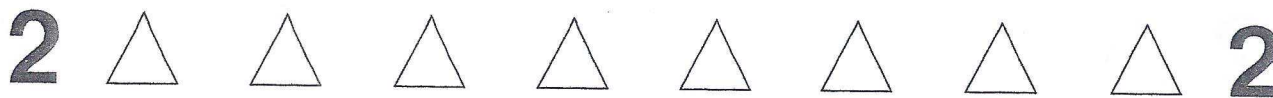
55. Given $|x - 3| > x - 3$, what is the solution set for the inequality?

- A. $x > 3$
- B. $x < 3$
- C. $x > 0$
- D. $x < 0$
- E. All real numbers

$$x-3 > x-3 \quad \text{OR} \quad x-3 < -x+3$$

$$-3 > -3 \quad 2x < 6$$

No Sol $x < 3$



DO YOUR FIGURING HERE.

56. Which of the following is equivalent to $\frac{i+7}{i-5} \cdot i$?

- F. -1
- G. $\frac{6}{13} - \frac{17}{13}i$
- H. $\frac{6}{13} + \frac{17}{13}i$
- J. $-\frac{1}{2} - \frac{3}{2}i$
- K. $\frac{1}{2} + \frac{3}{2}i$

$$\begin{aligned} \frac{i+7}{i-5} (i+5) &= \frac{34+12i}{-26} \cdot i \\ &= \frac{-12+34i}{-26} \\ &= \frac{6-17i}{13} \end{aligned}$$

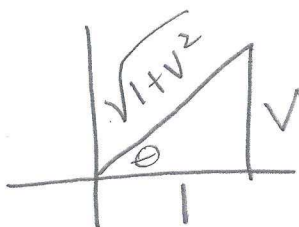
57. One square inch on the average pizza contains 50 calories. Alex bakes a 12" diameter pizza and cuts it into 8 equal slices. If his dad eats 3 slices and Alex only eats 2, approximately how many more calories did Alex's dad eat than he did?

- A. 100
- B. 700
- C. 1,400
- D. 2,100
- E. 2,200

$$36\pi(50) = 5652 \quad \frac{5652}{8} = 706.5$$

58. Given $\tan(\theta) = v$ where $0^\circ \leq \theta \leq 90^\circ$, which of the following could be an expression for $\cos(\theta)$?

- F. $\frac{v}{\sqrt{1+v^2}}$
- G. $\frac{\sqrt{1+v^2}}{v}$
- H. $\frac{1}{\sqrt{1+v^2}}$
- J. $\sqrt{1-v^2}$
- K. $\frac{\sqrt{1-v^2}}{v}$



59. Lisa, Carl, Max, Jenny, and Andy go to watch a movie and all sit next to each other in the same aisle. Andy must sit at either end of the group, but everyone else can sit anywhere within the group. How many possible seating arrangements are there?

- A. 15
- B. 48
- C. 56
- D. 92
- E. 120

Andy

$$\begin{aligned} \text{① } \underline{4} \ \underline{3} \ \underline{2} \ \underline{1} &= 24 \\ \text{OR} & \\ \underline{4} \ \underline{3} \ \underline{2} \ \underline{1} \ \text{①} &= 24 \\ \hline &48 \end{aligned}$$

2



2

DO YOUR FIGURING HERE.

60. In the standard (x, y) coordinate plane, points (m, n) and $(m - 2, n + \frac{2}{g})$ lie on the graph of the equation

$y = \frac{1}{3}x - t$, where $t > 1$. What is the value of g ?

- F. -3
 G. $-\frac{1}{4}$
 H. 1
 J. $\frac{7}{5}$
 K. $\frac{123}{5}$

$$\frac{n + \frac{2}{g} - n}{m - 2 - m} = \frac{1}{3}$$

$$\frac{\frac{2}{g}}{-2} = \frac{1}{3}$$

$$-\frac{1}{g} = \frac{1}{3}$$



If there is still time remaining, check your answers to this section.

Answer Key

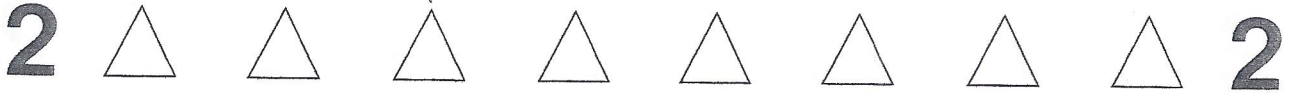
PRACTICE TEST 3

English Test

1. D	16. G	31. B	46. J	61. D
2. F	17. B	32. J	47. D	62. H
3. C	18. F	33. D	48. F	63. D
4. J	19. A	34. H	49. B	64. F
5. B	20. J	35. A	50. G	65. B
6. H	21. C	36. G	51. A	66. H
7. B	22. J	37. D	52. H	67. B
8. J	23. C	38. G	53. C	68. J
9. A	24. G	39. C	54. J	69. A
10. H	25. A	40. H	55. C	70. G
11. B	26. H	41. A	56. F	71. D
12. F	27. D	42. H	57. B	72. H
13. A	28. F	43. A	58. F	73. B
14. H	29. B	44. H	59. D	74. F
15. C	30. G	45. A	60. H	75. A

Math Test

1. E	13. C	25. B	37. D	49. A
2. G	14. F	26. F	38. G	50. F
3. D	15. C	27. C	39. D	51. C
4. H	16. K	28. G	40. K	52. G
5. A	17. E	29. C	41. C	53. E
6. J	18. K	30. J	42. K	54. K
7. D	19. D	31. B	43. C	55. B
8. G	20. G	32. F	44. G	56. G
9. B	21. C	33. B	45. E	57. B
10. G	22. F	34. K	46. F	58. H
11. E	23. E	35. A	47. E	59. B
12. H	24. H	36. J	48. H	60. F



MATHEMATICS TEST

60 MINUTES—60 QUESTIONS

Directions: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

DO YOUR FIGURING HERE.

1. A rectangle is four times as long as it is wide. If the width of the rectangle is 4.5 cm, what is the rectangle's area, in square centimeters?

- A. 17
B. 18
C. 45
D. 72
E. 81

$$4.5 \times 18 =$$

2. A bubble gum machine has 120 red, blue, yellow, and green gumballs in it. If 30 are yellow, 32 are red, and 28 are green, what is the probability that the next gumball out of the machine is NOT blue?

- F. $\frac{1}{4}$
G. $\frac{3}{4}$
H. 25%
J. 1:4
K. 2:1

$$\begin{array}{r} 30 \\ 32 \\ 28 \\ \hline 90 \end{array}$$

3. Which of the following is equivalent to 4×10^{-5} ?

- A. -2,000,000
B. -400,000
C. 0.00002
D. 0.00004
E. 0.000004

2

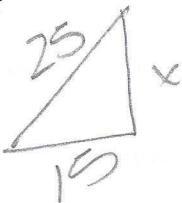


2

DO YOUR FIGURING HERE.

4. If a 25-foot ladder leans against a building and the base of the ladder is 15 feet from the bottom of the building, at what height does the top of the ladder touch the building?

F. 10 ft.
 G. 18 ft.
 H. 20 ft.
 J. 30 ft.
 K. 40 ft.



5. Which of the following is equivalent to $\sqrt{96}$?

A. $4\sqrt{6}$
 B. $6\sqrt{4}$
 C. $8\sqrt{6}$
 D. $8\sqrt{12}$
 E. $16\sqrt{6}$

$$\sqrt{16 \cdot 6}$$

6. What is the perimeter of a square with an area of 49?

F. 7
 G. 14
 H. 20
 J. 28
 K. 49

7. What is the slope of the line $4y = -2x + 4$?

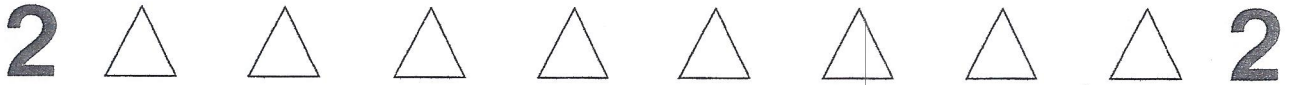
A. -2
 B. $-\frac{1}{2}$
 C. 1
 D. 2
 E. 4

$$y = -\frac{1}{2}x + 1$$

8. What is the slope of any line perpendicular to the line $5x - 4y = -12$ in the standard (x, y) coordinate plane?

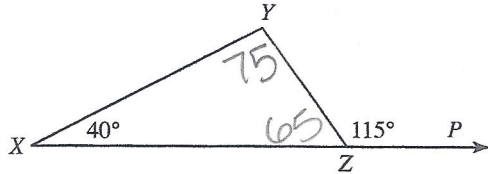
F. -4
 G. $-\frac{5}{4}$
 H. $-\frac{4}{5}$
 J. $\frac{4}{5}$
 K. $\frac{5}{4}$

$$\frac{5}{4} \perp \text{ slope} = -\frac{4}{5}$$



DO YOUR FIGURING HERE.

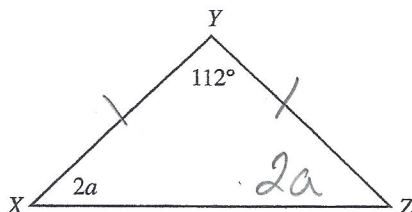
9. Given $\triangle XYZ$ with the angle measures shown below, and that point P lies on \overline{XZ} , what is $m\angle XYZ$?



- A. 25°
 B. 65°
 C. 75°
 D. 85°
 E. 140°
10. What is the area of a circle with a radius of 6?
- F. 8π
 G. 12π
 H. 16π
 J. 32π
 K. 36π
11. Bette's 2 pieces of bacon and 1 egg cost \$2.10. Jed's 3 pieces of bacon and 2 eggs cost \$3.45. How much does 1 egg cost?

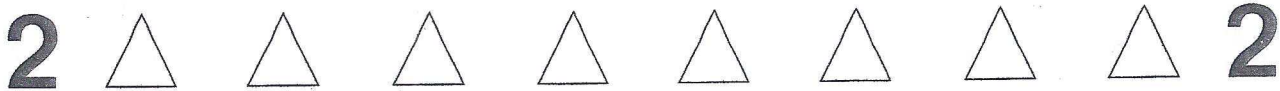
$$\begin{array}{r} 3(2B + E = 2.10) \\ 2(3B + 2E = 3.45) \\ \hline -6B - 3E = -6.3 \\ 6B + 4E = 6.9 \\ \hline E = .6 \end{array}$$

- A. 45 cents
 B. 50 cents
 C. 60 cents
 D. 70 cents
 E. 75 cents
12. $M, N,$ and x are all integers greater than 1. Given that $\frac{M}{24} + \frac{N}{108} = \frac{9M + 2N}{x}$, what must x equal?
- F. 11
 G. 12
 H. 132
 J. 216
 K. 2,592
13. If $\angle Y$ is the vertex of isosceles $\triangle XYZ$ (shown below), what is the value of a ?



$$\begin{array}{r} 2a + 2a + 112 = 180 \\ 4a + 112 = 180 \\ 4a = 68 \end{array}$$

- A. 16°
 B. 17°
 C. 34°
 D. 36°
 E. 39°



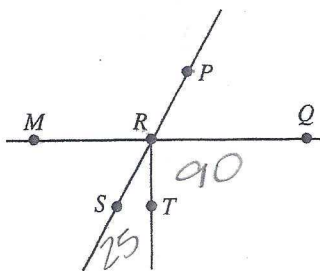
DO YOUR FIGURING HERE

14. A function f is defined by $f(x) = -3x^2 + 4x$. What is the value of $f(4)$?

- F. -40
- G. -32
- H. 32
- J. 52
- K. 136

$$\begin{aligned} & -3(4)^2 + 4(4) \\ & -48 + 16 \end{aligned}$$

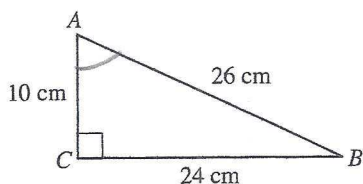
15. In the figure below, \overline{MQ} intersects \overline{PS} at point R , $m\angle TRS = 25^\circ$, and $\angle QRT$ is a right angle. What is the measure of $\angle MRP$?



- A. 75°
- B. 90°
- C. 105°
- D. 115°
- E. 165°

16. In $\triangle ABC$ below, what is $\tan \angle A$?

- F. $\frac{5}{13}$
- G. $\frac{5}{12}$
- H. $\frac{12}{13}$
- J. $\frac{12}{5}$
- K. $\frac{13}{5}$



$$\frac{24}{10}$$

17. Jenna wants to serve a large pot of soup to 25 people by 1:15 P.M. If it takes her 7 minutes to assemble the ingredients, 20 minutes to cut up the vegetables, and $2\frac{1}{2}$ hours to cook the soup on the stove, what is the latest time that Jenna could begin her meal preparation?

- A. 9:53 A.M.
- B. 9:58 A.M.
- C. 10:18 A.M.
- D. 10:21 A.M.
- E. 10:28 A.M.

$$\begin{array}{r} 12:75 \\ - 7:15 \\ \hline 2:57 \\ - 2:57 \\ \hline 10:18 \end{array}$$



DO YOUR FIGURING HERE.

18. Hiram's garden contains 45 tomato plants, 15 watermelon plants, and 120 lettuce plants. Approximately what percent of the garden is occupied by watermelon plants?

F. 0.12%
 G. 8.3%
 H. 12%
 J. 15%
 K. 83%

$$\frac{15}{180} = .08\bar{3}$$

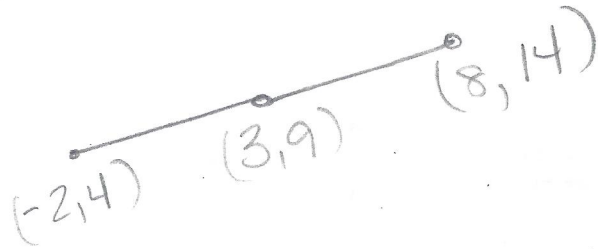
19. What is the additive inverse of the polynomial $5x^3 - 4x^2 + 6x - 9$?

A. $-5x^3 + 4x^2 - 6x - 9$
 B. $-5x^3 + 4x^2 - 6x + 9$
 C. $5x^3 - 4x^2 + 6x - 9$
 D. $-9 + 6x - 4x^2 + 5x^3$
 E. $9 - 6x - 4x^2 + 5x^3$

$$-(5x^3 - 4x^2 + 6x - 9)$$

20. In the standard (x, y) coordinate plane, if \overline{AB} has endpoint A at $(-2, 4)$ and midpoint M at $(3, 9)$, where is endpoint B located?

F. $(0.5, 6.5)$
 G. $(6.5, 0.5)$
 H. $(7, 1)$
 J. $(8, 14)$
 K. $(14, 8)$



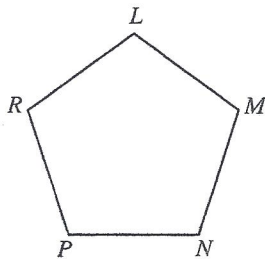
21. Which of the following, if any, is equivalent to the inequality $|x| - 4 < -7$?

A. $x < -3$ and $x > 3$
 B. $x > -3$ and $x < 3$
 C. $-3 < x < 3$
 D. $-3 > x$ and $3 < x$
 E. None of these.

$$|x| < -3$$

22. What is the sum of the interior angles of pentagon $\triangle LMNPR$?

F. 180°
 G. 540°
 H. 600°
 J. 720°
 K. 900°



$$(5-2)180$$

23. Which of the following values of n makes the statement $n^{1/2} = 4$ true?

A. 16
 B. 8
 C. 4
 D. 2
 E. $\frac{1}{8}$

$$\sqrt{n} = 4$$

$$n = 16$$



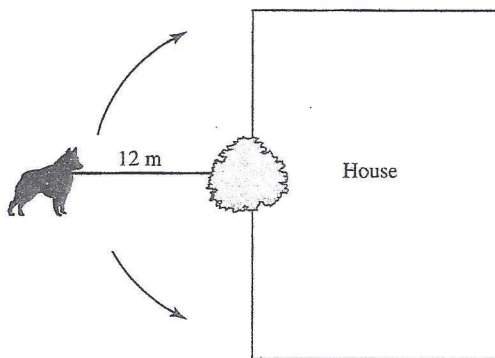
DO YOUR FIGURING HERE.

24. If a and b can be any two real numbers such that $b < -6$ and $3a - b = 21$, which of the following is a solution set for a ?

- F. $a \leq 9$
- G. $a \leq 5$
- H. $a < 5$
- J. $a \geq 9$
- K. $a \geq -5$

$$\begin{aligned}
 3a - b &= 21 \\
 -b &= -3a + 21 \\
 b &= 3a - 21 \\
 b < -6 \\
 3a - 21 < -6 \\
 a < 5
 \end{aligned}$$

25. Darcy used a 12-m piece of rope to tie her dog to a tree while she mowed her front yard. The dog could only walk in a semicircle because the tree was located directly next to the house (see diagram below). Assuming 3.14 for π , how much area, in square meters, could the dog cover?



- A. 57
- B. 75
- C. 113
- D. 226
- E. 452

$$\frac{12^2 \pi}{2} = 72\pi$$

26. For $3x \neq 2y$, the polynomial expression

$\frac{24x^2 - 7xy - 6y^2}{3x - 2y}$ is equivalent to which of the following?

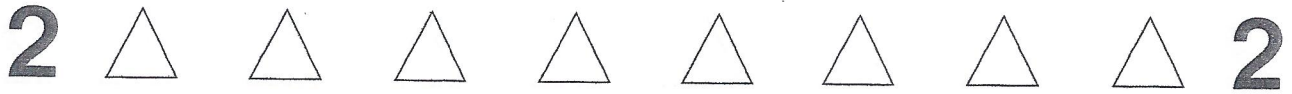
- F. $2x - 3y$
- G. $2x - 12y$
- H. $3x - 2y$
- J. $8x - 3y$
- K. $8x + 3y$

$$(3x - 2y)(8x + 3y)$$

27. Jose recently opened a new business. He projects that his profit will be \$25,000 for the first year, and will increase by 7% over the next 8 years. Which of the following best describes the sequence formed by his annual profits?

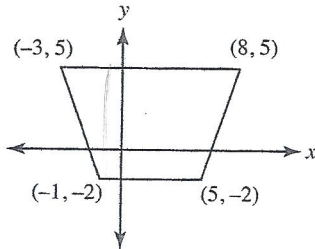
- A. Geometric with a common ratio of 0.07
- B. Geometric with a common ratio of 1.07
- C. Geometric with a common ratio of 1.7
- D. Arithmetic with a common difference of 25.07
- E. Arithmetic with a common difference of 25,000

$$\begin{aligned}
 25000(1+r)^8 \\
 1 + .07 = 1.07
 \end{aligned}$$



DO YOUR FIGURING HERE.

28. The trapezoid shown below in the standard (x, y) coordinate plane has vertices as marked. What is the area of the trapezoid in square units?



$$A = \frac{1}{2}(b_1 + b_2)h$$

$$A = \frac{1}{2}(11 + 6)7$$

$$\frac{17.7}{2}$$

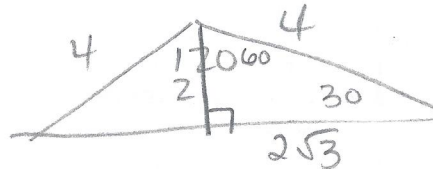
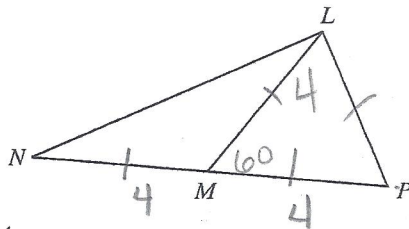
- F. 49.5
- G. 59.5
- H. 66
- J. 99
- K. 119

29. What is the greatest common factor of the terms $12x^4y^2$ and $6xy^3$?

- A. $6xy^2$
- B. $6x^4y^2$
- C. $6x^4y^3$
- D. $12xy^2$
- E. $12x^4y^3$

$$6 \times 4^2$$

30. In the figure below, M is the midpoint of \overline{NP} and $\triangle LMP$ is equilateral. If $\overline{NP} = 8$, what is the length of \overline{LN} ?



- F. 4
- G. $4\sqrt{2}$
- H. $4\sqrt{3}$
- J. 8
- K. $8\sqrt{3}$

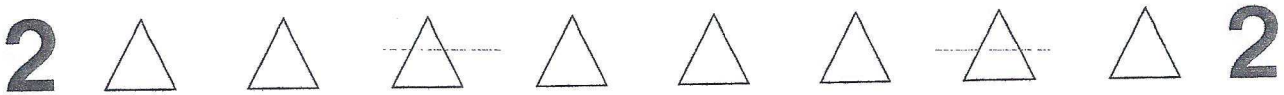
31. The formula for converting Celsius temperature to Fahrenheit temperature is $F = \frac{9}{5}C + 32$. If the current temperature is 122° Fahrenheit, what is the temperature in Celsius?

- A. 50°
- B. 59.7°
- C. 65.5°
- D. 162°
- E. 277.2°

$$122 = \frac{9}{5}C + 32$$

$$90 = \frac{9}{5}C$$

$$50 = C$$



DO YOUR FIGURING HERE.

32. If a ratio is selected at random from the set

$\left\{\frac{1}{3}, \frac{3}{5}, \frac{3}{7}, \frac{5}{7}, \frac{5}{9}\right\}$, what is the probability that the ratio is greater than $\frac{1}{2}$?

- F. $\frac{1}{5}$
- G. $\frac{2}{5}$
- H. $\frac{3}{5}$
- J. $\frac{2}{3}$
- K. $\frac{4}{5}$

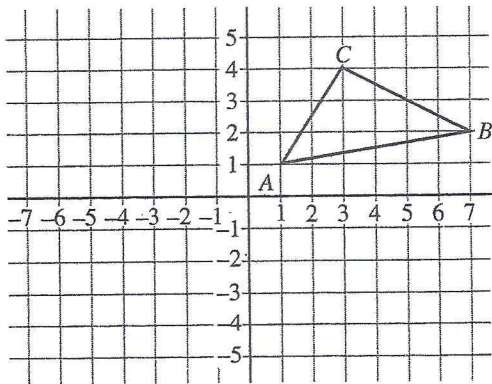
3/5

33. Gertrude's Diner offers three different types of salads, two soups, four vegetable sides, five main dishes, and three desserts. If a customer can choose a salad or a soup along with one main dish, one vegetable side, and one dessert, how many different meal combinations are possible?

- A. 17
- B. 19
- C. 300
- D. 360
- E. 21,600

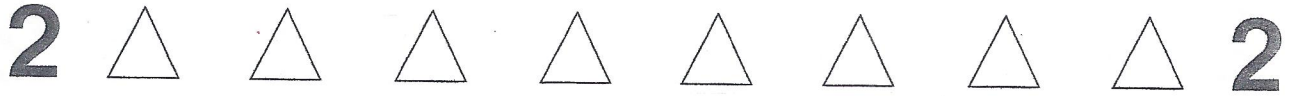
3+2
↓
5 × 4 × 5 × 3

34. As shown below, $\triangle ABC$ has vertices at points $A(1, 1)$, $B(7, 2)$, and $C(3, 4)$. If $\triangle ABC$ was reflected about the origin to form a new triangle, $\triangle A'B'C'$, which of the following correctly lists the coordinates of points A' , B' , and C' , respectively?



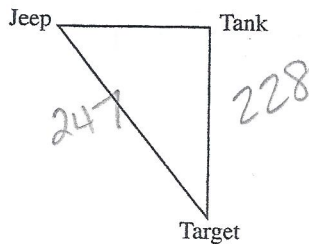
- ~~E.~~ (1, 1); (2, 7); (4, 3)
- ~~G.~~ (-1, 1); (-7, 2); (-4, 3)
- H. (-1, -1); (-7, -2); (-3, -4)
- ~~J.~~ (-1, -1); (-2, -7); (-3, -4)
- ~~K.~~ (1, -1); (7, -2); (3, -4)

$(x, y) \rightarrow (-x, -y)$



DO YOUR FIGURING HERE.

35. A military tank is 228 meters due north of its target. The commander's jeep is due west of the tank and 247 meters north/northwest of its target. Which of the following gives the distance, in meters, between the tank and the jeep?



$$x^2 + 228^2 = 247^2$$

$$x^2 = 9025$$

- A. 19
 B. 95
 C. 190
 D. 475
 E. 9,025
36. What is the matrix product of $[x \ 2x \ 3x] \cdot \begin{bmatrix} 6 \\ 0 \\ -2 \end{bmatrix}$?
- F. $[6x \ 0 \ -6x]$
 G. $[-6x \ 0 \ 6x]$
 H. $\begin{bmatrix} 6x & 12x & 18x \\ 0 & 0 & 0 \\ -2x & -4x & -6x \end{bmatrix}$
 J. $[0]$
 K. $\begin{bmatrix} 6x & 0 & -2x \\ 12x & 0 & -4x \\ 18x & 0 & -6x \end{bmatrix}$
37. Which of the following expresses the number of meters an athlete must travel in a 6-lap race around a circular track with a diameter of X meters?
- A. $6\pi X^2$
 B. $3\pi X^2$
 C. $\frac{3}{2}\pi X^2$
 D. $6\pi X$
 E. $3\pi X$
38. For all real numbers m and n such that the product of m and 4 is n , which of the following expressions represents the sum of m and 4 in terms of n ?
- F. $n + 4$
 G. $4n + 4$
 H. $4(n + 4)$
 J. $\frac{n+4}{4}$
 K. $\frac{n}{4} + 4$

$$1 \times 3 \quad 3 \times 1$$

$$C = \pi X$$

$$6\pi X$$

$$4m = n$$

$$m = \frac{n}{4}$$

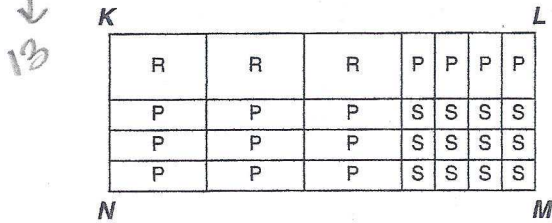
$$m + 4$$

$$\frac{n}{4} + 4$$



DO YOUR FIGURING HERE.

39. As shown below, rectangle $KLMN$ is divided into 3 large squares (each labeled R) that measure x centimeters on a side, 12 small squares (each labeled S) that measure y centimeters on a side, and 12 rectangles (each labeled P). What is the total area, in square centimeters, of rectangle $KLMN$?



$$3x^2 + 12xy + 12y^2 + 13xy$$

- A. $3x + 4xy + 9yx + 12y$
 B. $12x + 4xy + 9yx + 3y$
 C. $3x^2 + 13xy + 12y^2$
 D. $12x^2 + 13xy + 3y^2$
 E. $3x^3 + 13xy + 12y^{12}$

40. For some real number D , the graph of the line $y = (D - 3)x + 7$ in the standard (x, y) coordinate plane passes through the point $(-5, 2)$. What is the slope of this line?

$$\begin{aligned} 2 &= (D-3)(-5) + 7 \\ 2 &= -5D + 15 + 7 \\ -20 &= -5D \\ D &= 4 \end{aligned}$$

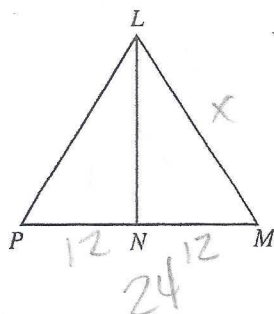
- F. -3
 G. -2
 H. 0
 J. 1
 K. 4

41. When graphed in the standard (x, y) coordinate plane, the lines $x = -6$ and $y = 2x - 4$ intersect at what point?

$$y = 2x - 4$$

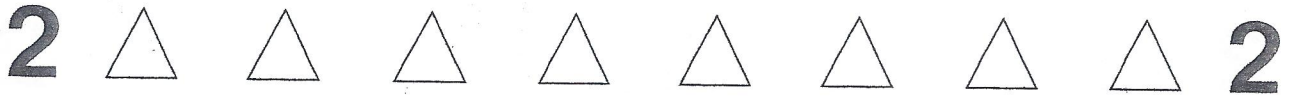
- A. $(-16, -6)$
 B. $(-6, -16)$
 C. $(-6, 8)$
 D. $(-6, 16)$
 E. $(8, -6)$

42. In $\triangle LMP$, shown below, \overline{LN} is the perpendicular bisector of \overline{PM} , $\cos \angle LMP = 0.4$, and $\overline{PM} = 24$ inches. How many inches long is \overline{LM} ?



$$\begin{aligned} \cos \angle M &= \frac{12}{x} \\ 0.4 &= \frac{12}{x} \end{aligned}$$

- F. 9.6
 G. 30
 H. 40
 J. 48
 K. 60



DO YOUR FIGURING HERE.

43. A music instructor charges \$30 per lesson, plus an additional fee for violin rental. The charge for the violin varies directly with the square root of the time the violin is used. If a lesson plus 25 minutes of violin rental costs \$65, how much would it cost for a lesson plus 81 minutes of violin rental?

- A. \$ 93
- B. \$105
- C. \$111
- D. \$141
- E. \$146

$$C = k\sqrt{t}$$

$$65 = k\sqrt{25}$$

$$7 = k$$

$$C = 7\sqrt{t}$$

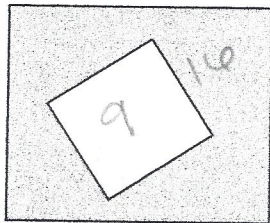
$$C = 7\sqrt{81}$$

$$63$$

$$+ 30$$

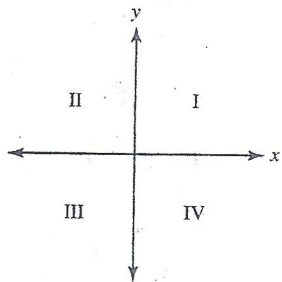
44. The figure below shows a small square inside of a larger square. The smaller square has sides 3 inches long, and the area of the shaded region is 16 square inches. What is the length, in inches, of one side of the larger square?

- F. 4
- G. $\sqrt{19}$
- H. 5
- J. $\sqrt{28}$
- K. 25



A = 25

45. The quadrants of the standard (x, y) coordinate plane are labeled in the figure below. For each value of θ , let $x = \cos \theta$ and $y = \sin \theta$. Whenever $(\sin \theta) \left(\frac{1}{\cos \theta} \right) < 0$, the points (x, y) on the unit circle can lie in which of the following quadrants?



- A. III only
- B. IV only
- C. I and III only
- D. II and III only
- E. II and IV only

$$x \left(\frac{1}{y} \right) < 0$$

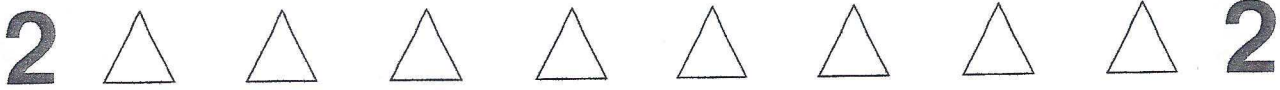
$$\frac{x}{y} < 0$$

$x \neq y$ opp signs

46. For $i^2 = -1$, $(3 - i)^2 = ?$

- F. 16
- G. $2i$
- H. $4i$
- J. $10 - 6i$
- K. $8 - 6i$

$9 - 6i + i^2$



DO YOUR FIGURING HERE.

47. The volume of a sphere is determined by the equation $\frac{4}{3}\pi r^3$, where r is the radius of the sphere.

In a given model of the solar system, all of the planets are perfect spheres. If the radius of Mars is exactly 4 times greater than the radius of Venus, how many times the volume of Venus is the volume of Mars?

- A. 81
- B. 64
- C. 16
- D. 12
- E. 4

$$\frac{4}{3}\pi(4r)^3$$

$$\frac{4}{3}\pi(64r^3)$$

48. Which of the following is equivalent to $\sqrt[3]{16r^6}$?

- F. $4r^3$
- G. $4r^4$
- H. $8r^3$
- J. $8r^4$
- K. $32r^{12}$

$$4r^3$$

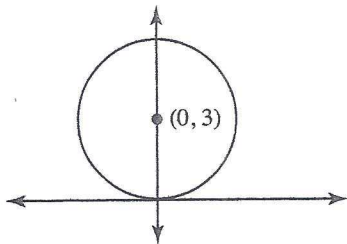
49. If 2 is a solution of the equation $x^2 + kx + 12 = 0$, what does k equal?

- A. -12
- B. -8
- C. -2
- D. 6
- E. 8

$$4 + 2k + 12 = 0$$

$$2k = -16$$

50. In the standard (x, y) coordinate plane, the center of the circle shown below lies on the y -axis at $y = 3$. If the circle is also tangent to the x -axis, then what is the equation of the circle?



$$(x-0)^2 + (y-3)^2 = 9$$

- F. $x^2 + (y - 3)^2 = 6$
- G. $x^2 + (y - 3)^2 = 9$
- H. $x^2 + (y + 3)^2 = 9$
- J. $(x - 3)^2 + y^2 = 6$
- K. $(x + 3)^2 + y^2 = 9$

2



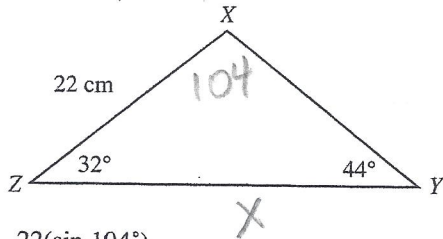
2

DO YOUR FIGURING HERE.

51. Which of the following equations summarizes the data listed below?

x	-2	-1	0	1	2
y	-8	-5	-2	1	4

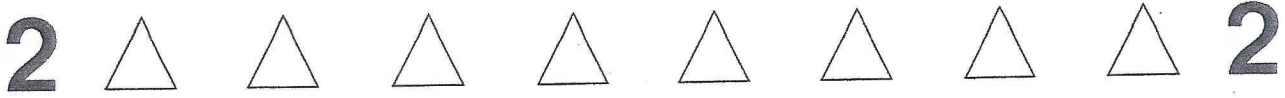
- A. $y = -2x - 2$
 B. $y = 2x - 4$
 C. $y = 2x + 3$
 D. $y = 3x - 2$
 E. $y = 3x + 2$
52. The law of sines states that for any triangle, the ratio between the sine of an angle and the length of the side opposite that angle is the same for all of the interior angles in the triangle. In $\triangle XYZ$ shown below, $\overline{ZX} = 22$ cm, $\angle Z = 32^\circ$, and $\angle Y = 44^\circ$. What is the length of \overline{ZY} ?



- F. $\frac{22(\sin 104^\circ)}{\sin 32^\circ}$
 G. $\frac{\sin 32^\circ(\sin 104^\circ)}{\sin 44^\circ}$
 H. $\frac{22(\sin 32^\circ)}{\sin 104^\circ}$
 J. $\frac{22(\sin 104^\circ)}{\sin 44^\circ}$
 K. $\frac{22(\sin 44^\circ)}{\sin 104^\circ}$

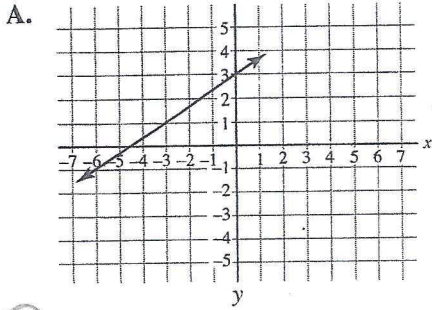
$$\frac{\sin 104^\circ}{X} = \frac{\sin 44^\circ}{22}$$

$$\frac{22 \sin 104^\circ}{\sin 44^\circ} = X$$

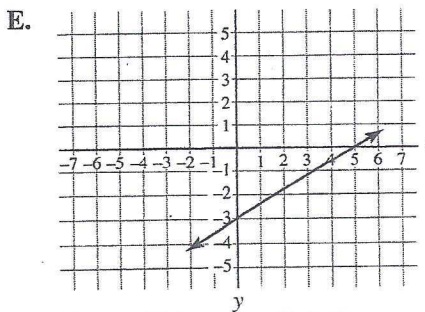
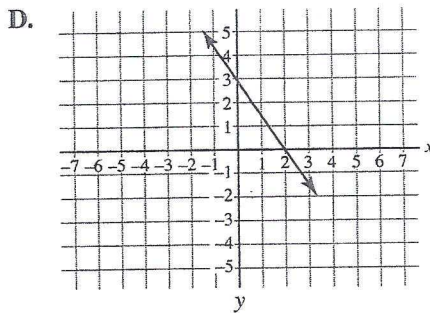
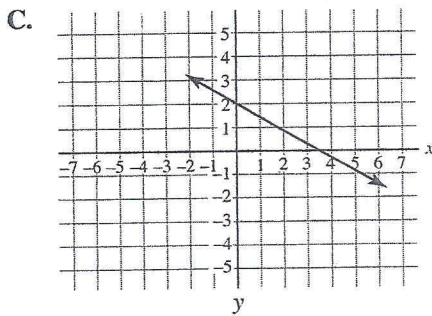
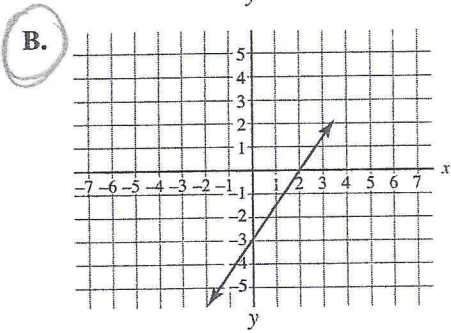


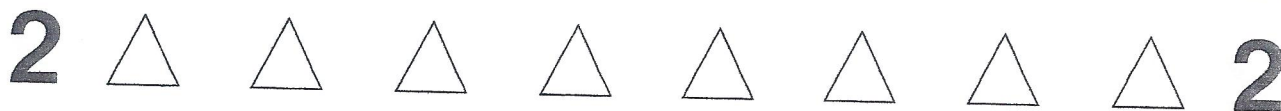
DO YOUR FIGURING HERE.

53. Which of the following is the graph of the equation $3x - 2y = 6$?



$y = \frac{3}{2}x - 3$





DO YOUR FIGURING HERE.

54. For $\sqrt{(3)(7)} \cdot \sqrt{(m)(n)} \cdot \sqrt{(7)(5)}$ to be an integer, with m and n representing positive prime numbers, the sum of $m + n$ must equal which of the following?

F. 8
 G. 10
 H. 12
 J. 15
 K. 21

55. Cam is going into business selling umbrellas. He pays \$25,000 for a building and machinery, and each umbrella costs \$4.00 to manufacture. If Cam sells x umbrellas for \$6.50 each, which of the following equations best represents his net profit in dollars?

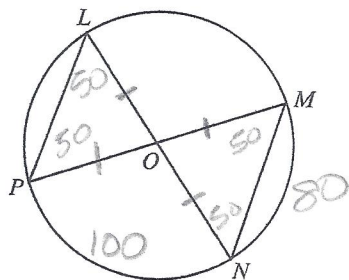
A. $10.50x - 25,000$
 B. $6.50x - 25,000$
 C. $4.00x + 25,000$
 D. $4.00x - 25,000$
 E. $2.50x - 25,000$

$$P = R - C$$

$$P = 6.5x - (4x + 25000)$$

$$P = 2.5x - 25000$$

56. In the circle shown below, O lies on the center of the circle and on chords \overline{LN} and \overline{MP} . The measure of $\widehat{PN} = 100^\circ$. Which of the following statements is NOT true?



- F. $m \angle PLN = 50^\circ$
 G. $m \angle POL = 80^\circ$
 H. $\angle PON \cong \angle NOM$
 J. $\angle POL \cong \angle NOM$
 K. $\overline{LP} \parallel \overline{MN}$
57. For all real numbers m and n , when is the equation $|m - n| = |m + n|$ true?
- A. Never
 B. Always
 C. Only when $m = n$
 D. Only when $m = 0$ and $n = 0$
 E. Only when $m = 0$ or $n = 0$

2



2

DO YOUR FIGURING HERE.

58. What is the value of $\log_4 16$?

- F. 2
 G. 4
 H. 12
 J. 20
 K. 64

$$4^x = 16$$

59. Television screen sizes are measured on the diagonal. Joshua bought a new television with a 24-inch screen and gave his old 21-inch television to his younger brother. If Joshua is watching a soccer ball that appears to be 4 inches in diameter on his new screen, how long does the diameter of the same ball, to the nearest tenth of an inch, appear to his brother watching on the smaller screen?

- A. 3
 B. 3.5
 C. 4.6
 D. 3π
 E. 3.5π

$$\frac{21}{24} = \frac{x}{4}$$

60. When $0^\circ < x < 90^\circ$, which of the following is NOT equal to $\tan x$?

- F. $\frac{\sin x}{\cos x}$
 G. $(\sin^2 x + \cos^2 x)(\tan x)$
 H. $\frac{\sec x}{\csc x}$
 J. $\frac{(\sin^2 x + \cos^2 x)}{\cot x}$
 K. $\frac{\cos x}{\sin x}$



If there is still time remaining, check your answers to this section.

Answer Key

PRACTICE TEST 4

English Test

1. D	16. F	31. B	46. F	61. B
2. G	17. D	32. J	47. A	62. H
3. B	18. F	33. A	48. H	63. A
4. F	19. C	34. F	49. A	64. J
5. C	20. G	35. D	50. G	65. A
6. H	21. C	36. J	51. A	66. F
7. D	22. H	37. B	52. H	67. B
8. G	23. A	38. H	53. D	68. H
9. A	24. G	39. A	54. F	69. A
10. F	25. D	40. J	55. C	70. J
11. D	26. G	41. C	56. G	71. D
12. J	27. A	42. J	57. D	72. G
13. B	28. J	43. C	58. J	73. C
14. J	29. D	44. J	59. B	74. H
15. D	30. F	45. B	60. H	75. A

Math Test

1. E	13. B	25. D	37. D	49. B
2. G	14. G	26. K	38. K	50. G
3. D	15. D	27. B	39. C	51. D
4. H	16. J	28. G	40. J	52. J
5. A	17. C	29. A	41. B	53. B
6. J	18. G	30. H	42. G	54. F
7. B	19. B	31. A	43. A	55. E
8. H	20. J	32. H	44. H	56. H
9. C	21. E	33. C	45. E	57. E
10. K	22. G	34. H	46. K	58. F
11. C	23. A	35. B	47. B	59. B
12. J	24. H	36. J	48. F	60. K

