

Alg II - day 8 - 2005

Name: Key**Solve:**

$x^2 + 6x + 8 \leq 0$

$-4 \leq x \leq -2$

$x^2 - 4x + 4 > 0$

all reals
except $x=2$

$x^2 - 5x + 2 < 0$

$\frac{5 - \sqrt{17}}{2} < x < \frac{5 + \sqrt{17}}{2}$

Find the determinant:

$\begin{pmatrix} 3 & 2 \\ 4 & 5 \end{pmatrix} \quad 7$

$\begin{pmatrix} 3 & -4 \\ 1 & -3 \end{pmatrix} \quad -5$

$\begin{pmatrix} 4 & 1 & 3 \\ 7 & 2 & 0 \\ 1 & -1 & 3 \end{pmatrix} \quad -24 ?$

$\begin{pmatrix} 1 & 3 & 2 \\ -2 & 5 & -1 \\ 0 & 6 & 2 \end{pmatrix} \quad 4$

Evaluate Exactly:

$8^{\frac{-2}{3}} = \frac{1}{4}$

$16^{\frac{-3}{4}} = \frac{1}{8}$

$1000^{\frac{-1}{3}} = \frac{1}{10}$

Solve (to the nearest hundredth):

$3^x = 13$

2.33

$2^x = 27$

4.75

$3^x = 17$

2.58

$6^{2x+1} = 50$

$.59$

$7^{x+2} = 10$

$-.82$

$4^{5x-7} = 191$

2.16

Solve for x (exactly):

$$\log_7 x = 2$$

49

$$\log 1000 = x$$

3

$$\log_x 81 = 4$$

3

$$4^{x-1} = 64$$

4

$$\log_x 16 = 4$$

2

$$\log x = 0$$

1

$$\log_4 32 = x$$

5/2

$$\log_3 (3x+1) = 2$$

8/3

$$\log_x 64 = \frac{2}{3}$$

512

$$\log_{\frac{1}{8}} 16 = x$$

-4/3

$$\log_2 8 = 3x+4$$

-1/3

$$\log_9 3x = 3$$

243

$$\log x + \log(x+3) = \log 54$$

6

Write as a single logarithm:

$$\log 7 + \log 4 = \log 28$$

$$\log 20 - \log 3 = \log \frac{20}{3}$$

$$4 \log 3 = \log 81$$

$$\ln \frac{x^3 y^2}{x^5} =$$

$$3 \ln x + 2 \ln y - 5 \ln x = \ln y^2 / x^2$$

$$\frac{-2}{3} \log 64 = \log \frac{1}{16}$$

$$5 \ln x - 2 \ln y - 6 \ln x = \ln \frac{1}{xy^2}$$

$$2 \log 3 + 3 \log 2 =$$

log 72

$$2 \log 3 - 2 \log 5 =$$

log 9/25

$$\frac{1}{3} \log 27 = \log 3$$

Find the sum & product of the roots:

$$2x^2 - 5x + 3 = 0$$

$$S = 5/2 \quad P = 3/2$$

$$x^2 - 6x + 20 = 0 \quad S = 6 \quad P = 20$$

Write the quadratic equations with roots of:

$$\left\{ -\frac{1}{4}, \frac{1}{3} \right\}$$

$$\{ 7 + \sqrt{2}, ______ \}$$

$$\{ 5 - 4i, ______ \}$$

$$12x^2 - x - 1 = 0$$

$$x^2 - 14x + 47 = 0$$

$$x^2 - 10x + 41 = 0$$

Simplify:

$$i^{741}$$

i

$$\sqrt{-24}$$

$$2i\sqrt{6}$$

$$(3+i)(3-i)$$

$$10$$

$$\frac{2+i}{4-i}$$

$$\frac{7+6i}{17}$$

$$|3+7i|$$

$$\sqrt{58}$$

Solve:

$$2x^2 - 3x + 7 = 0$$

$$x = \frac{3 \pm i\sqrt{47}}{4}$$

$$6x^2 + 5x + 1 = 0$$

$$x = -\frac{1}{2}, -\frac{1}{3}$$

$$3x^2 - 8x + 50 = 2x(x - 3)$$

$$x = 1 \pm 7i$$

List the PRR, number of +/- real roots, graph & solve:

$$x^5 + x^4 - 13x^3 - 13x^2 + 36x + 36 = 0$$

$$x = -1, 2, -2, 3, -3$$

Divide by long or synthetic division:

$$x+2 \overline{) 4x^4 - 5x^3 + 11x - 7}$$

$$4x^3 - 13x^2 + 26x - 41 + \frac{75}{x+2}$$

$$\frac{3x^3 - 9x + 7}{x+3}$$

$$3x^2 - 9x + 18 + \frac{-47}{x+3}$$

Solve:

$$x^2 + 6x + 9 \geq 0$$

all reals

$$6x^2 + 8x + 3 < 0$$

No Sol.

$$x^2 + 7x + 1 > 0$$

$$x < \frac{-7 - 3\sqrt{5}}{2} \text{ or } x > \frac{-7 + 3\sqrt{5}}{2}$$

A. Find the determinant:

1. $\begin{pmatrix} 3 & 2 \\ 4 & 5 \end{pmatrix}$ 7

2. $\begin{pmatrix} 1 & 3 & 2 \\ -2 & 5 & -1 \\ 0 & 6 & 2 \end{pmatrix}$ 4

B. Solve:

3. $x^2 + 6x + 9 \geq 0$

all reals

4. $6x^2 + 8x + 3 < 0$

No solution

5. $x^2 + 7x + 1 > 0$

$$x < \frac{-7 - 3\sqrt{5}}{2} \text{ or } x > \frac{-7 + 3\sqrt{5}}{2}$$

C. Simplify:

6. i^{41678} -1

9. $|2 + 5i|$ $\sqrt{29}$

7. $\sqrt{-44}$ $2i\sqrt{11}$

10. $\frac{3}{2-i}$ $\frac{6+3i}{5}$

8. $(3+i)^2$ $8+6i$

D. Find the sum & product of the roots:

11. $2x^2 + 5x - 7 = 0$

$$S = -\frac{5}{2} \quad P = -\frac{7}{2}$$

12. $x^2 + 6x - 8 = 0$

$$S = -6 \quad P = -8$$

E. Write the quadratic equations with roots of:

13. $\{3 - \sqrt{5}, \quad\}$

$$x^2 - 6x + 4 = 0$$

14. $\{5 - 2i, \quad\}$

$$x^2 - 10x + 29 = 0$$

F. Solve (to the nearest hundredth):

15. $13^x = 5$

$x = .63$

16. $7^{x-3} = 12$

$x = 4.28$

G. Evaluate (by hand):

17. $\log_x 125 = 3$

$x = 5$

18. $\log_2 x = 4$

$x = 16$

19. $\log_7 49 = x$

$x = 2$

H. Write as a single logarithm:

20. $\log 20 - \log 10 = \log 2$

22. $2\log 7 = \log 49$

21. $\log 6 + \log 7 = \log 42$

23. $\frac{1}{2}\log_7 9 = \log_7 3$

I. Solve for x & y using Cramer's Rule:

24. $\begin{cases} 3x + 2y = 8 \\ 5x - 3y = 7 \end{cases}$

$(2, 1)$

$D = -19$

$N_x = -38$

$N_y = -19$

J. List the PRR, number of +/- real roots, & solve:

25. $x^3 - 7x^2 + 14x - 8 = 0$

$x = 1, 2, 4$

A. Solve:

1. $x^2 + 2x - 8 < 0$

$$-4 < x < 2$$

2. $x^2 + 6x + 1 = 0$

$$x = -3 \pm 2\sqrt{2}$$

3. $|x+3| > 3$

$$x < -6 \text{ or } x > 0$$

4. $3(x+2)+2=10$

$$x = 4/5$$

5. $2x^3 - x^2 - 13x - 6 = 0$

$$x = -\frac{1}{2}, -2, 3$$

6. $x^2 + 2x + 9 = 0$

$$x = -1 \pm 2i\sqrt{2}$$

7. $x^2 + 10x + 25 < 0$

$$\text{No sol.}$$

B. Simplify:

8. i^{471} $-i$

9. $(3+i)(4-2i)$ $14-2i$

10. $\sqrt{-28}$ $2i\sqrt{7}$

11. $\frac{7}{2+i}$ $\frac{14-7i}{5}$

C. Write the quadratic equations with roots of:

12. $\{7+2i, \quad\}$

$$x^2 - 14x + 53 = 0$$

13. $\{2+\sqrt{7}, \quad\}$

$$x^2 - 4x - 3 = 0$$

D. Find the determinant:

14. $\begin{pmatrix} 3 & 4 \\ 1 & 3 \end{pmatrix}$ 5

15. $\begin{pmatrix} 4 & 1 & 3 \\ 7 & 2 & 0 \\ 1 & -1 & 3 \end{pmatrix}$ -24

E. Solve for x & y using Cramer's Rule:

16.
$$\begin{aligned} 2x + 5y &= 9 \\ 5x - 2y &= 7 \end{aligned}$$

$$\left(\frac{53}{29}, \frac{31}{29} \right)$$

F. Find the sum & product of the roots:

17. $2x^2 + 6x - 1 = 0$

$$S = -3 \quad P = -\frac{1}{2}$$

18. $x^2 - 7x + 2 = 0$

$$S = 7 \quad P = 2$$

G. Solve (to the nearest hundredth):

19. $3^x = 13$

$$2.33$$

20. $4^{x-1} = 64$

$$4$$

21. $2^x = 27$

$$4.75$$

22. $\log_7 x = 2$

$$49$$

23. $\log 1000 = x$

$$3$$

24. $\log_x 81 = 4$

$$3$$

H. Write as a single logarithm:

25. $2\log 3 + 3\log 2 =$

$$\log 72$$

26. $2\log 3 - 2\log 5 =$

$$\log \frac{9}{25}$$

27. $\frac{1}{3}\log 27 =$

$$\log 3$$

Solve:

$$6x^3 + 17x^2 - 5x - 6 = 0$$

$$x = -3, \frac{2}{3}, -\frac{1}{2}$$

$$5(x-1) + 2x = 20$$

$$25/7$$

$$15 - \frac{2}{3}x > -5$$

$$x < 30$$

$$x^2 - 3x \geq 10$$

$$x \leq -2 \text{ or } x \geq 5$$

$$|x+2| < 7$$

$$-9 < x < 5$$

$$x^3 + 9x^2 + 26x + 24 = 0$$

$$x = -2, -3, -4$$

$$2x^2 + 3x + 8 = 0$$

$$\frac{-3 \pm i\sqrt{55}}{4}$$

$$x^2 - 10x + 25 \geq 0$$

$$\text{all real \#}'s$$

$$2x^2 + 7x + 3 < 0$$

$$-3 < x < -\frac{1}{2}$$

$$|2x-5| > 7$$

$$x > 6 \text{ or } x < -1$$

Simplify:

$$i^{47132}$$

$$1$$

$$\sqrt{-17} \quad i\sqrt{17}$$

$$(5+i)(3-i) \quad 16-2i$$

$$|4+i|$$

$$\sqrt{17}$$

$$\frac{3}{2-i}$$

$$\frac{6+3i}{5}$$

Write the quadratic equations with roots of:

$$\{4-i, ___\}$$

$$\left\{3, \frac{-1}{2}\right\}$$

$$\{3-\sqrt{5}, ___\}$$

$$x^2 - 8x + 17 = 0$$

$$2x^2 - 5x - 3 = 0$$

$$x^2 - 6x + 4 = 0$$

Find the determinant:

By hand:

$$\begin{pmatrix} 3 & 1 \\ 7 & -2 \end{pmatrix}$$

$$-13$$

$$\begin{pmatrix} 1 & 4 & 2 \\ 3 & 0 & 5 \\ 1 & 0 & 2 \end{pmatrix}$$

$$-4$$

On calc:

$$\begin{pmatrix} -4 & 1 & 5 \\ 3 & 2 & 0 \\ -1 & -1 & -5 \end{pmatrix}$$

$$60$$

Solve for x & y using Cramer's Rule (or RREF on calc):

By hand:

$$3x + 2y = 7$$

$$5x - y = 4$$

$$\left(\frac{15}{13}, \frac{23}{13}\right)$$

On calc:

$$\begin{matrix} 2x + 5y = 9 \\ 5x - 2y = 7 \end{matrix} \left(\frac{53}{29}, \frac{31}{29}\right)$$

$$2x + 4y + z = 0$$

$$3x - y + 2z = -1$$

$$x + 6y - 3z = 7$$

$$(1, 0, -2)$$

Find the sum & product of the roots:

$$2x^2 + 5x - 7 = 0$$

$$S = -5/2 \quad P = 7/2$$

$$x^2 + 6x - 8 = 0$$

$$S = -6 \quad P = -8$$

Solve (to the nearest hundredth):

$$5^x = 13$$

$$1.59$$

$$8^x = 213$$

$$2.58$$

Solve (by hand):

$$6^{x+1} = 216$$

$$x = 2$$

$$\log_5 \frac{1}{25} = x$$

$$x = -2$$

$$\log_x 32 = 5$$

$$x = 2$$

$$\log_7 1 = x$$

$$x = 0$$

$$9^{x-1} = \frac{1}{27}$$

$$x = -1/2$$

$$\log_x 81 = \frac{4}{3}$$

$$x = 27$$

Write as a single logarithm:

$$2\log 3 + 3\log 5 =$$

$$\log 1125$$

$$3\log 2 - \log 9 =$$

$$\log \frac{8}{9}$$

$$\frac{1}{4}\log 16 =$$

$$\log 2$$

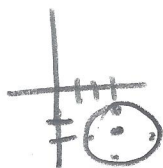
Change to standard form, find the center & radius, and graph:

$$x^2 + y^2 - 6x + 4y + 12 = 0$$

$$(x-3)^2 + (y+2)^2 = 1$$

$$C = (3, -2)$$

$$r = 1$$

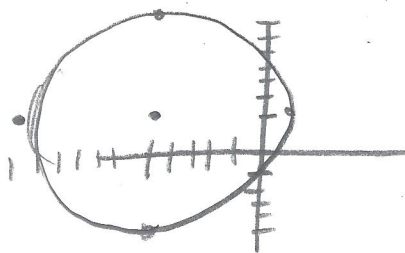


$$x^2 + y^2 + 10x - 2y - 10 = 0$$

$$(x+5)^2 + (y-1)^2 = 36$$

$$C = (-5, 1)$$

$$r = 6$$



Solve:

$$8 + 2(x - 5) = 14$$

$$x = 8$$

$$3(2x + 1) = 6x - 7$$

$$\text{No Sol.}$$

$$x^2 - 6x + 10 = 0$$

$$3 \pm i$$

$$5x^2 - 4x = 33$$

$$x = 3, -\frac{11}{5}$$

$$x^3 + 8x^2 + 11x - 20 = 0$$

$$x = 1, -4, -5$$

$$|2x - 5| = 7$$

$$x = 6, -1$$

$$|x + 3| \leq 6$$

$$-9 \leq x \leq 3$$

$$|3 - 2x| > 11$$

$$x < -4 \text{ or } x > 7$$

$$2x^2 + 9x + 4 \geq 0$$

$$x \leq -4 \text{ or } x \geq -\frac{1}{2}$$

$$x^2 + 6x + 9 < 0$$

$$\text{No Sol.}$$

Simplify:

$$i^{731} - i$$

$$\sqrt{-18} \quad 3i\sqrt{2}$$

$$|2 + 5i| \quad \sqrt{29}$$

$$(3 + i)(7 - i) \\ 22 + 4i$$

$$\frac{4 + 3i}{4 - 3i} \quad \frac{7 + 24i}{25}$$

Write the quadratic equations with roots of:

$$\{5 - 2i, ___\}$$

$$\{9, 9\}$$

$$\{7 + \sqrt{3}, ___\}$$

$$x^2 - 10x + 29 = 0$$

$$x^2 - 18x + 81 = 0$$

$$x^2 - 14x + 46 = 0$$

Find the determinant:

$$\begin{pmatrix} -2 & -5 \\ 1 & 2 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 3 & 2 \\ 0 & 1 & 4 \\ 2 & 1 & -2 \end{pmatrix}$$

14

Solve for x & y using Cramer's Rule (or RREF on calc):

By hand:

$$\begin{aligned} 5x + 3y &= 8 \\ 7x - 4y &= 10 \end{aligned}$$

$$\left(\frac{62}{41}, \frac{6}{41} \right)$$

On calc:

$$\begin{aligned} 2x + 3y &= -14 \\ x - y &= -2 \end{aligned}$$

$$(-4, -2)$$

$$x + 2y - 3z = 11$$

$$2x + y - 2z = 9$$

$$4x + 3y + z = 16$$

$$(2, 3, -1)$$

Solve (to the nearest hundredth):

$$3^x = 17$$

$$2.58$$

$$5^{3x-2} = 49$$

$$1.47$$

Solve (by hand):

$$\log_3 x = 3 \quad x = 27$$

$$\log_x 64 = 3 \quad x = 4$$

$$\log_6 \frac{1}{6} = x \quad x = -1$$

$$\log 0.001 = x \quad x = -3$$

$$27^{2x+1} = \frac{1}{9} \quad -5/6$$

$$\log_8 \frac{1}{4} = x \quad x = -2/3$$

Write as a single logarithm:

$$2\log 3 + 3\log 2 = \log 72$$

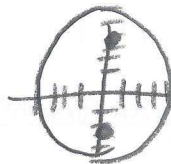
$$5\log 2 - 2\log 5 = \log \frac{32}{25}$$

$$2\log 4 = \log 16$$

Ellipse:

$$\frac{x^2}{16} + \frac{y^2}{25} = 1$$

$$\begin{aligned} C &= (0, 0) \\ R_x &= 4 \\ R_y &= 5 \\ C &= 3 \end{aligned}$$



$$\begin{aligned} V &= (0, \pm 5) \\ CV &= (\pm 4, 0) \\ F &= (0, \pm 3) \end{aligned}$$

Find the center & radius, and graph:

$$(x+1)^2 + (y-3)^2 = 16$$

$$C = (-1, 3) \quad r = 4$$



$$x^2 + y^2 + 2x + 4y - 4 = 0$$

$$x^2 + y^2 - 12x = 0$$

$$\begin{aligned} (x+1)^2 + (y+2)^2 &= 9 \\ C &= (-1, -2) \\ r &= 3 \end{aligned}$$

$$\begin{aligned} (x-6)^2 + y^2 &= 36 \\ C &= (6, 0) \\ r &= 6 \end{aligned}$$

