Key

Alg II Day 1

A) Simplify

1) i^2 -1

2) i^{43} $-i$

3) i^{672} 1

4) $\sqrt{-8}$ $2i\sqrt{2}$

5) $\sqrt{-36}$ $6i$

6) $(2+i)(3-i)$ $7+i$

7) $(3+i)^2$ $8+6i$

8) $\frac{7}{2+i}$ $\frac{14-7i}{5}$

9) $\sqrt{-12}+\sqrt{-18}$ $2i\sqrt{3}+3i\sqrt{2}$

10) $\frac{2+i}{5-i}\cdot\frac{(5+i)}{(5+i)}$ $\frac{9+7i}{26}$

B) Solve

11) $x^2+3x+2=0$ $-1,-2$

12) $x^2+4x+6=0$ $\frac{-4\pm\sqrt{16-4(6)}}{2}$ $\frac{-4\pm\sqrt{-8}}{2}$ $\frac{-4\pm 2i\sqrt{2}}{2}$ $-2\pm i\sqrt{2}$

13) $2x^2+6x-3=0$ $\frac{-6\pm\sqrt{36+24}}{4}$ $\frac{-3\pm\sqrt{15}}{2}$

14) $x^2-2x-9=0$ $\frac{2\pm\sqrt{4+36}}{2}$ $1\pm\sqrt{10}$

C) Divide

15) $(x^3+6x^2-3x-1)\div(x+2)$

$x^2+4x-11+\frac{21}{x+2}$

x^3+2x^2

$4x^2-3x$

$4x^2+8x$

$-11x-22$

16) $(2x^2-4x+1)\div(x-3)$

$2x+2+\frac{7}{x-3}$

$2x^2-6x$

$2x+1$

$2x+6$

7

17) $(x^3+5x^2-6x+2)\div(x+3)$

$x^2+2x-12+\frac{38}{x+3}$

x^3+3x^2

$2x^2-6x$

$-12x+2$

$-12x+36$

18) $(2x^2-8x+3)\div(x-1)$

$2x-6+\frac{-3}{x-1}$

$2x^2-2x$

$-6x+3$

$-6x+6$

D) List the possible rational roots for each:

19) $x^3-3x^2+6x-8=0$

$\pm(1,2,4,8)$

20) $5x^2-6x+1=0$

$\pm\left(1,\frac{1}{5}\right)$

21) $2x^3-4x^2+6x-5=0$

$\pm\left(1,5,\frac{1}{2},\frac{5}{2}\right)$

$* \frac{(4+2i)}{(3-i)}$

Name:_____

Alg II – day 2

A. Simplify:

1. $\sqrt{-8}$ $2i\sqrt{2}$

2. $\sqrt{-16}$ $4i$

3. i^{43} $-i$

4. $(i+3)(i-5)$ $-16-2i$

5. $(2i+1)(3i-1)$ $-7+i$

6. i^{67} $-i$

7. $i^3+i^4+i^5+i^6$ 0

8. $\frac{7}{2i}$ $\frac{-7i}{2}$

9. $\frac{3}{i+3}$ $\frac{-9+3i}{-10}$

10. $\frac{7+i}{4-i}$ $\frac{27+11i}{17}$

B. Solve:

11. $x^2-4x+2=0$ $2\pm\sqrt{2}$

12. $x^2+12x+35=0$ $x=-7,-5$

13. $2x^2-5x-3=0$ $(2x+1)(x-3)$ $x=3,-1/2$

14. $x^2+7x-3=0$ $\frac{-7\pm\sqrt{61}}{2}$

15. $3x^2-9x+2=0$ $\frac{9\pm\sqrt{57}}{6}$

16. $x^2+8x+1=0$ $-4\pm\sqrt{15}$

17. $8x^2-7x-3=0$ $\frac{7\pm\sqrt{145}}{16}$

Name:_____

Alg II – day 3

A. Simplify:

1. $(3+i)(5-i)$ $16+2i$

2. $8i^7$ $-8i$

3. $\frac{4}{2+3i}$ $\frac{8-12i}{13}$

4. $\frac{3+i}{7-i}$ $\frac{2+i}{5}$

5. $(4+2i)(3-5i)$ $22-14i$

6. i^{71637} i

B. Solve:

$2x^2+5x-7=0$ $(2x+7)(x-1)$ $x=\frac{-7}{2}, 1$

$x^2+6x-8=0$ $-3\pm\sqrt{17}$

$x^2+5x+11=0$ $\frac{-5\pm\sqrt{25-44}}{2}$ $\frac{-5\pm i\sqrt{19}}{2}$

C. Find the sum & product of the roots:

10. $x^2+7x-3=0$ $S=-7$ $P=-3$

11. $3x^2-9x+2=0$ $S=3$ $P=\frac{2}{3}$

12. $x^2+8x+1=0$ $S=-8$ $P=1$

13. $8x^2-7x-3=0$ $S=\frac{7}{8}$ $P=\frac{-3}{8}$

D. Write the quadratic equations with roots of:

14. $\{-5,-6\}$ $x^2+11x+30=0$

15. $\{-1,9\}$ $x^2-8x-9=0$

$\frac{2}{16}$ $-\frac{3}{16}$

16. $\left\{\frac{3}{4},-\frac{1}{4}\right\}$ $16x^2-8x-3=0$

17. $\{-5,5\}$ $x^2-25=0$

18. $\{4+\sqrt{2},\_\_\_\_\}$ $x^2-8x+14=0$

19. $\{3-4i,\ 3+4i\}$ $x^2-6x+25=0$

List the possible rational roots (PRR):

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

$\pm(1,2,4,8)$

$6x^3+5x^2+2x+10=0$

$\pm(1,2,5,10,\frac{1}{2},\frac{5}{2},\frac{1}{3},\frac{2}{3},\frac{5}{3},\frac{10}{3},\frac{1}{6},\frac{5}{6})$

Use Descartes Rule of Signs to list the possible number of pos/neg real roots:

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

(+) 0

(−) 3 or 1

$3x^4-4x^3+2x^2+x-6=0$

(+) 3 or 1

(−) 1

Divide:

$$x+2\overline{)x^3+6x^2-3x-1}$$

$x^2+4x-11+\frac{21}{x+2}$

x^3+2x^2

$4x^2-3x$

$4x^2+8x$

$-11x-1$

$-11x-22$

$$x-3\overline{)2x^3-7x^2-6x+8}$$

$2x^2-x-9+\frac{-19}{x-3}$

$-2x^3+6x^2$

$-x^2-6x$

$-x^2+3x$

$-9x+8$

$-9x+27$

A-L

5+3L

Alg II – day 4

Name: Key

A. Simplify:

1. $\sqrt{-12}$ $2i\sqrt{3}$

2. i^{73} i

3. $(2+i)(3-i)$ $7+i$

4. $|2+3i|$ $\sqrt{13}$

5. $\frac{2+i}{7-i}$ $\frac{13+9i}{50}$

B. Find the sum & product of the roots:

6. $x^2-8x+5=0$ $S=8$ $P=5$

7. $3x^2+2x-5=0$ $S=-2/3$ $P=-5/3$

C. Write the quadratic equations with roots of:

8. $\{7, -2\}$ $x^2-5x-14=0$

9. $\{2+\sqrt{7}, \quad\}$ $x^2-4x-3=0$

10. $\{3-i, \quad\}$ $x^2-6x+10=0$

11. $\{\frac{1}{2}, \frac{2}{5}\}$ $10x^2-9x+2=0$

F. Solve:

16. $x^3-5x^2-2x+24=0$

$x=-2,3,4$

17. $2x^3-3x^2-2x+3=0$

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

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

$x=-1,2,\pm i$

Alg II – day 5

Name:_____

A. Simplify:

$\sqrt{-18}$

$3i\sqrt{2}$

i^{7164}

1

$(5+i)^2$

$24+10i$

$|3-i|$

$\sqrt{10}$

$\frac{3+i}{4-i}\ (4+i)$

$\frac{11+7i}{17}$

B. Find the sum & product of the roots:

$2x^2-7x+1=0$

$S=\frac{7}{2}\quad P=1/2$

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

$S=\frac{-2}{5}\quad P=\frac{-6}{5}$

C. Write the quadratic equations with roots of:

8. $\left\{\beta, \frac{1}{5}\right\}$ $S=\frac{16}{5}$ $P=3/5$

$5x^2-16x+3=0$

9. $\{7-2i, \_\_\_\_\}$

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

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

10. $x^3-2x^2-5x+6=0$

	1	−2	−5	6
1		1	−1	−6
	1	−1	−6	0

$x=1, 3, -2$

11. $x^3-x^2-9x+9=0$

	1	−1	−9	9
1		1	0	−9
	1	0	−9	0

$x=1, 3, -3$

12. $x^3-4x^2-5x+14=0$

	1	−4	−5	14
−2		−2	12	−14
	1	−6	7	0

$\frac{6\pm\sqrt{36-4(7)}}{2}$

$-2, 3\pm\sqrt{2}$

E. Solve for x:

13. $\log_3 27 = x$

$x = 3$

14. $\log_{10} .01 = x$

$x = -2$

15. $\log_x 16 = 4$

$x = 2$

16. $\log_{\frac{1}{8}} 4 = x$

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

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

17. $\log_2 16 = 2x - 1$

$2x - 1 = 4$

$x = \frac{5}{2}$

18. $\log_{25} x = \frac{3}{2}$

$x = 125$

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

$x^{2/3} = 64$

$x = 512$

20. $\log_3 81 = x$

$3^x = 81$

$x = 4$

Evaluate Exactly:

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

$9^{\frac{-1}{2}} = \frac{1}{3}$

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

$16^{-\frac{1}{4}} = \frac{1}{2}$

$25^{-\frac{1}{2}} = \frac{1}{5}$

$81^{\frac{3}{4}} = 27$

Divide by long or synthetic division:

$x-3\overline{)2x^3-6x^2-3x+1}$

$\frac{3x^3-2x+7}{x-4}$

3 | 2 −6 −3 1

6 0 −9

2 0 −3 | −8

$2x^2 - 3 + \frac{-8}{x-3}$

4 | 3 0 −2 7

12 48 184

3 12 46 | 191

$3x^2 + 12x + 46 + \frac{191}{x-4}$