Algebra 2 Name: _____

Study Guide for the Quadratic Functions Quiz 2

LT4: Solve quadratic equations by factoring and graphing (4-5 Pg. 226)

Directions: Solve each of the following equations using factoring

1a.) $x^2 + 9x + 20 = 0$

4 5

$(x+5)(x+4)=0$

$x+5=0 \quad x+4=0$

$x=-5 \quad x=-4$

1b.) $x^2 + 14x + 45 = 0$

5 9

$(x+5)(x+9)=0$

$x+5=0 \quad x+9=0$

$x=-5 \quad x=-9$

2a.) $x^2 + 6x - 27 = 0$

+9 -3

$(x+9)(x-3)$

$x+9=0 \quad x-3=0$

$x=-9 \quad x=3$

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

-9 2

$(x-9)(x+2)=0$

$x-9=0 \quad x+2=0$

$x=9 \quad x=-2$

3a.) $2x^2 + 12x + 10 = 0$ 20, 10 2

$(2x^2+10x)(2x+10)=0$

$2x(x+5) \quad 2(x+5)=0$

$2x+2=0 \quad x+5=0$

$x=-1 \quad x=-5$

3b.) $3x^2 + 14x + 8 = 0$ 24, 12 2

$3x^2+12x+2x+8=0$

$3x(x+4)+2(x+4)=0$

$3x+2=0 \quad x+4=0$

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

LT5: Solve quadratic equations using the quadratic formula (4-7 Pg. 240)

Directions: Find the discriminant of each of the equations and give the number of real solutions for each

4a.) $5x^2 + 7x - 9 = 0$ b^2-4ac

$a=5 \; b=7 \; c=-9$

$7^2-4(5)(-9)=229$

2 real solutions

4b.) $x^2 - 5x + 7 = 0$

$a=1 \; b=-5 \; c=7$

$(-5)^2-4(1)(7)=-3$

no real solutions

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

$(-6)^2-4(3)(3)$

$36-36=0$

1 real solution

5b.) $8x^2 + 3x - 7 = 0$

$3^2-4(8)(-7)$

$9+224=233$

2 real solutions

Directions: Solve each equation using the quadratic formula

6a.) $3x^2 + 5x - 8 = 0$

$\frac{-5\pm\sqrt{5^2-4(3)(-8)}}{2(3)}$

$\frac{-5\pm\sqrt{121}}{6}$

$\frac{-5+11}{6}=\frac{6}{6}=1$

$\frac{-5\pm 11}{6}$

$\frac{-5-11}{6}=\frac{-16}{6}=-2\frac{4}{6}$

6b.) $x^2 - 6x + 9 = 0$

$\frac{+6\pm\sqrt{6^2-4(1)(9)}}{2(1)}$

$\frac{6\pm\sqrt{0}}{2} \quad \frac{6\pm 0}{2}=3$

7a.) $x^2 - 3x = 4$ -4

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

$\frac{-3\pm\sqrt{3^2-4(1)(-4)}}{2(1)}$

$\frac{3\pm\sqrt{25}}{2}$

$\frac{3+5}{2}=4$

$\frac{3-5}{2}=-1$

7b.) $5x^2 + 7x - 6 = 0$

$\frac{-7\pm\sqrt{49-4(5)(-6)}}{10}$

$\frac{-7\pm\sqrt{169}}{10}$

$\frac{-7+13}{10}=\frac{6}{10}=\frac{3}{5}$

$\frac{-7-13}{10}=-2$

Algebra 2 Name: _____

LT6: Identify, graph, and perform operations with complex numbers (4-8 Pg. 248)

Directions: Simplify each of the square roots below to write in terms of i

8a.) $\sqrt{-100}$

$\sqrt{-1}\cdot\sqrt{100}$

$10i$

8b.) $\sqrt{-25}$

$\sqrt{-1}\sqrt{25}$

$5i$

9a.) $3+\sqrt{-81}$

$3+\sqrt{81}\sqrt{-1}$

$3+9i$

9b.) $\sqrt{-4}+8$

$\sqrt{4}\cdot\sqrt{-1}+8$

$2i+8$

10a.) $12-\sqrt{-144}$

$12-\sqrt{144}\sqrt{-1}$

$12-12i$

10b.) $\sqrt{-75}+9$

$\sqrt{25}\cdot\sqrt{3}\sqrt{-1}+9$

$5i\sqrt{3}+9$

Directions: Solve each of the quadratic equations to find the complex conjugate (in terms of i)

11a.) $x^2-10x+29=0$

$\frac{10\pm\sqrt{10^2-4(1)(29)}}{2(1)}$

$\frac{10\pm\sqrt{-16}}{2}$

$\frac{10\pm 4i}{2}$

$5\pm 2i$

11b.) $x^2-4x+5=0$

$\frac{4\pm\sqrt{16-4(1)(5)}}{2(1)}$

$\frac{4\pm\sqrt{-4}}{2}$

$\frac{4\pm 2i}{2}$

$2\pm i$

12.) $5x^2-6x+9=0$

$\frac{6\pm\sqrt{(-6)^2-4(5)(9)}}{10}$

$\frac{6\pm\sqrt{-144}}{10}$

$\frac{6\pm 12i}{10}\rightarrow\frac{3}{5}\pm\frac{6}{5}i$

LT7: Solve and graph systems of equations involving quadratic functions (4-9 Pg. 258)

Directions: Solve each of the systems of equations below using either graphing or algebra.

13.) $\begin{cases} y=x^2-10x+12 \\ y=2x+12 \end{cases}$

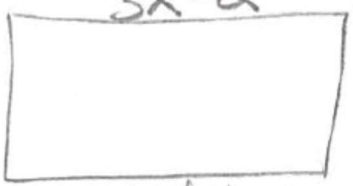
graph (0,12) (12,36)

14.) $\begin{cases} y=3x^2-x+1 \\ y=3x^2+x-1 \end{cases}$

graph (1,3)

BONUS: Jaylin is planning a rectangular garden. Its length is 2 ft less than three times its width. Its area is 65 ft^2. What are the dimensions of the garden?

$A=l\cdot w$



$A=x(3x-2)=65$

$3x^2-2x=65$

$-65\quad -65$

$3x^2-2x-65=0$

graph

$x=5$

$2(5)-2=13$

length = 13 width = 5