Name _____ Date _____ Period _____

Solving Quadratics Review

☐ I recognize the Zero Product Property and can solve two step equations

1. Solve the quadratic using the Zero Product Property

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

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

$4x=3$ $\quad 2x=-4$

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

b) $(2x-3)(7x-14)=0$

$2x-3=0$ $\quad 7x-14=0$

$2x=3$ $\quad 7x=14$

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

c) $(x+3)(2x-2)=0$

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

$x=-3$ $\quad 2x=2$

$x=1$

d) $(3x+6)^2=0$ → or √ both sides

$(3x+6)(3x+6)$

$3x+6=0$ $\quad (3x+6)^2=0$

$3x=-6$ $\quad 3x+6=\sqrt{0}=0$

$x=-2$ same $\quad 3x+6=0$

☐ I can solve a square root using

2. Solve the equation using square roots

You can leave as a square root if it is not a perfect square under the root.

a) $x^2=9$

$x=\pm\sqrt{9}$

$x=3,-3$

b) $4x^2=4$

$x^2=1$

$x=\pm\sqrt{1}$

$x=1,-1$

c) $x^2-4=20$

$x^2=24$

$x=\pm\sqrt{24}$

d) $-3x^2+5=-30$

$-3x^2=-35$

$x^2=\frac{35}{3}$ → $x=\pm\sqrt{\frac{35}{3}}$

☐ I can simplify an expression following the order of operations

3. Evaluate the expression

a) $\sqrt{4^2-4(1)(4)}$

$\sqrt{16-16}$

0

b) $\frac{-3+\sqrt{(-5)^2-19}}{4}$

$\frac{-3+\sqrt{25-19}}{4}$

$\frac{-3+\sqrt{6}}{4}$

c) $\frac{-(-7)-\sqrt{(-1)^2-(2)(-4)}}{2(2)}$

$\frac{7-\sqrt{1+8}}{4}=\frac{7-\sqrt{9}}{4}$

$\frac{7-3}{4}$

$\frac{4}{4}$

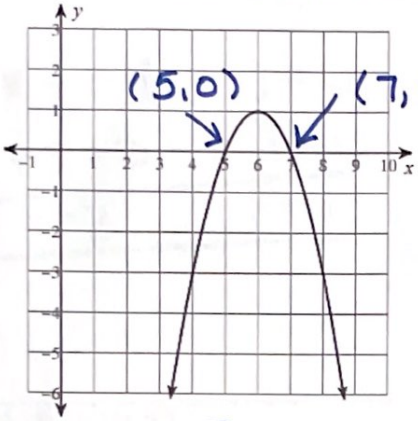
1

☐ I can explain how solutions relate to the number of x-intercepts

4. State the zeros for each graph of the function

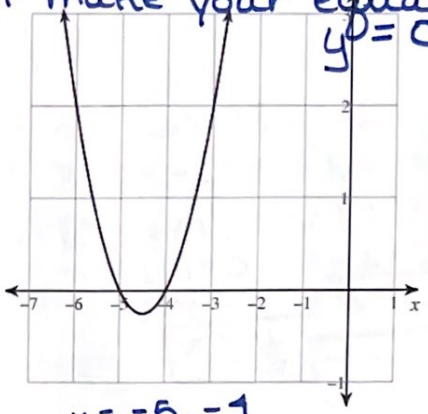
The zeros/roots are the values of x that make your equation y = 0

a)



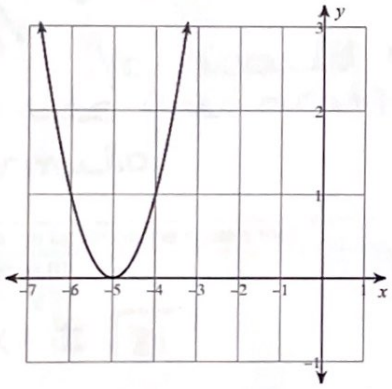
x = 5, 7

c)



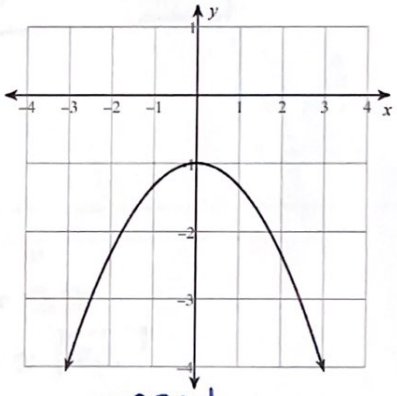
x = -5, -1

b)



x = -5

d)



no real roots

5. How do you solve a quadratic function from the graph?
(for example, how do you solve $x^2 - 5x - 36 = 0$ given the graph for $f(x) = x^2 - 5x - 36$?)

To find the solution of $x^2 - 5x - 36 = 0$, you can graph $y = x^2 - 5x - 36$. Find the x-intercepts, where y = 0 on the graph. The value of x makes the equation true and is the solution.

	3x	1
x	$3x^2$	1x
-2	-6x	-2

OR

$(3x+1)(x-2)$

☐ I can solve a quadratic equation using the zero product property, taking the square roots, and using the quadratic formula.

6. Solve by factoring and zero product property.

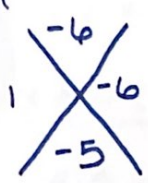
a) $x^2 + 2x - 3 = 0$

$(x+3)(x-1)=0$

$x+3=0 \quad x-1=0$

$x=-3 \quad x=1$

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



1 · 6
2 3

$3x^2-6x+1x-2$

$3x(x-2)+1(x-2)$

$(3x+1)(x-2)=0$

$3x+1=0 \quad x-2=0$

$3x=-1 \quad x=2$

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

c) $4x^2 - 13x = 3$

$4x^2-13x-3=0$

-12

1 12
2 6
3 4

not factorable

-13

You would need to use quadratic formula.

d) $2x^2 - 4x = 0$

$2x(x-2)=0$

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

$x=0 \quad x=2$

7. Solve by taking the square root.

a) $x^2 = 81$

$x=\pm\sqrt{81}$

$x=\pm 9$

b) $-2x^2 = -50$

$x^2=25$

$x=\pm\sqrt{25}$

$x=\pm 5$

c) $x^2 - 3 = 1$

$x^2=4$

$x=\pm 2$

d) $3x^2 + 3 = 0$

$3x^2=-3$

$x^2=-1$

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

no real solution

You can leave your solution with a square root if it does not simplify to a whole number.

8. Solve by the quadratic formula. List you're a, b, and c values first.

a) $2x^2 - 3x - 15 = 5$ $2x^2-3x-20=0$

$a=2 \quad b=-3 \quad c=-20$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$= \frac{-(-3) \pm \sqrt{(-3)^2-4(2)(-20)}}{2(2)}$$

$$= \frac{3 \pm \sqrt{9+160}}{4} = \frac{3 \pm \sqrt{169}}{4}$$

$x = \frac{3+13}{4}$ $\quad x = \frac{3-13}{4}$

$= \frac{16}{4}$ $\quad = \frac{-10}{4}$

$x = 4$ $\quad x = \frac{-5}{2}$

b) $3x^2 - 2x = -6$

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

$a=3 \quad b=-2 \quad c=6$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2-4(3)(6)}}{2(3)}$$

$$= \frac{4 \pm \sqrt{4-72}}{6} = \frac{4 \pm \sqrt{-68}}{6}$$

no real solution

c) $2x^2 - 7x - 3 = 0$

$a=2 \quad b=-7 \quad c=-3$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2-4(2)(-3)}}{2(2)}$$

$$= \frac{7 \pm \sqrt{49+24}}{4}$$

$$x = \frac{7 \pm \sqrt{73}}{4}$$

d) $5r^2 = 80$

Put in standard form. For the missing term, substitute 0x.

$5r^2+0x-80=0$ →

$a=5 \quad b=0 \quad c=-80$

$$x = \frac{-(0) \pm \sqrt{0^2-4(5)(-80)}}{2(5)}$$

$$= \frac{0 \pm \sqrt{1600}}{10} = \frac{\pm 40}{10}$$

$x = \frac{40}{10}$ $\quad x = \frac{-40}{10}$

$x = 4 \quad x = -4$