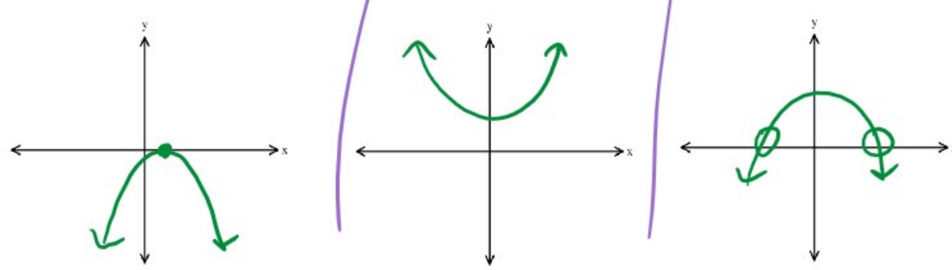
Ch 10 Notes KEY

Thursday, October 5, 2023 8:08 AM

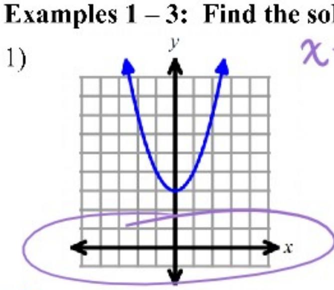
10.1 Notes: Solving Quadratics by Square Rooting

Objectives:

- Solve quadratic equations by square rooting.
- Determine when a quadratic equation has no solution.

Quadratic Expression	highest power of x is 2 ← degree is 2 $3x^{2} - 8x + 5$
Quadratic Equation	a quadratic expression and an = sign $8x^2 = 16$ $(2x-1)^2 = 4$
Quadratic Function	$y = ax^2 + bx + c$ $y = a(x-h)^2 + k$ $y = a(x-p)(x-q)$ (degree 2) * input (x) and an output (y) **Note: we will learn how to graph quadratic functions in Chapter 11.**
Solutions of a Quadratic Function	**Solutions of a quadratic function are the** x **-intercepts.** We can have 1 solution, 0 solution, or 2 solutions. 

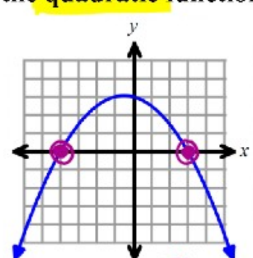
Examples 1 – 3: Find the solution(s), if any, of the quadratic functions that are graphed below.

1) 

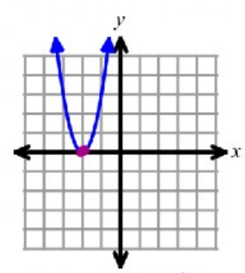
x-int

$\boxed{\varnothing}$ no solution

NS

2) 

$\boxed{x = 3 \text{ and } x = -4}$

3) 

$\boxed{x = -2}$

Alternate Terms for "x –intercepts"	$\boxed{x\text{-int}}$ zeros, roots, or solutions	
Solving a Quadratic Equation by Square Rooting →	① isolate $(\sim)^2$ term (cancel outside #s by using inverse operations) ② STOP: $(\sim)^2 =$ POSITIVE (or 0) ③ square root both sides $(\pm)$ ④ isolate the variable	**Note:** When a variable^2 or $(\ )^2$ is isolated, it **cannot** equal a **negative** number. $(\sim)^2 \neq$ neg. If it does, then there is NO solution. $\boxed{\emptyset}$

Examples #1 – 6: Solve each equation for the variable by square rooting.

1) $z^2 - 5 = 4$

$+5 \quad +5$

$\sqrt{z^2} = \sqrt{9}$

$\boxed{z = \pm 3}$

2) $r^2 + 7 = 4$

$-7 \quad -7$

$r^2 = -3$

neg

$\boxed{\emptyset}$

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

$-3 \quad -3$

$\frac{4x^2}{4} = \frac{0}{4}$

$\sqrt{x^2} = \sqrt{0}$

$\boxed{x = 0}$

You Try #4 – 6!

4) $-3x^2 + 4 = -23$

$-4 \quad -4$

$\frac{-3x^2}{-3} = \frac{-27}{-3}$

$\sqrt{x^2} = \sqrt{9}$

$\boxed{x = \pm 3}$

5) $4t^2 + 17 = 17$

$-17 \quad -17$

$\frac{4t^2}{4} = \frac{0}{4}$

$\sqrt{t^2} = \sqrt{0}$

$\boxed{t = 0}$

6) $p^2 + 8 = 0$

$-8 \quad -8$

$p^2 = -8$

negative

$\boxed{\emptyset}$

Examples 7 – 8: Solve. Simplify radical answers. **You Try #8!**

7) $5b^2 - 3 = 97$

$+3 \quad +3$

$\frac{5b^2}{5} = \frac{100}{5}$

$\sqrt{b^2} = \sqrt{20}$

$\boxed{b = \pm 2\sqrt{5}}$

$\sqrt{20}$: $2 \wedge 10$, $2 \wedge 5$

8) $-3a^2 + 4 = -32$

$-4 \quad -4$

$\frac{-3a^2}{-3} = \frac{-36}{-3}$

$\sqrt{a^2} = \sqrt{12}$

$\boxed{a = \pm 2\sqrt{3}}$

$\sqrt{12}$: $2 \wedge 6$, $2 \wedge 3$

Examples 9 – 14: Solve for the variable. Simplify any radical answers.

9) $\sqrt{(x-2)^2} = \sqrt{25}$

$x - 2 = \pm 5$
$+2 \quad +2$
$x = 2 \pm 5$
$2+5 \quad 2-5$
$\boxed{x=7 \quad x=-3}$

10) $(x+1)^2 - 3 = 3$
$+3 \quad +3$
$\sqrt{(x+1)^2} = \sqrt{6}$
$x + 1 = \pm\sqrt{6}$
$-1 \quad -1$
$\boxed{x = -1 \pm \sqrt{6}}$
$-1+\sqrt{6} \quad -1-\sqrt{6}$

11) $5(x+1)^2 - 3 = 77$
$+3 \quad +3$
$\frac{5(x+1)^2}{5} = \frac{80}{5}$
$\sqrt{(x+1)^2} = \sqrt{16}$
$x + 1 = \pm 4$
$-1 \quad -1$
$x = -1 \pm 4$
$-1+4 \quad -1-4$
$\boxed{x=3 \quad x=-5}$

You Try #12 – 14!

12) $\sqrt{(x+4)^2} = \sqrt{36}$

$x + 4 = \pm 6$
$-4 \quad -4$
$x = -4 \pm 6$
$-4+6 \quad -4-6$
$\boxed{x=2 \quad x=-10}$

13) $(x-5)^2 + 1 = 11$
$-1 \quad -1$
$\sqrt{(x-5)^2} = \sqrt{10}$
$x - 5 = \pm\sqrt{10}$
$+5 \quad +5$
$\boxed{x = 5 \pm \sqrt{10}}$

14) $4(a-3)^2 - 8 = 0$
$+8 \quad +8$
$\frac{4(a-3)^2}{4} = \frac{8}{4}$
$\sqrt{(a-3)^2} = \sqrt{2}$
$a - 3 = \pm\sqrt{2}$
$+3 \quad +3$
$\boxed{a = 3 \pm \sqrt{2}}$

Examples 15 – 18: Solve for the variable. Simplify any radical answers.

15) $-3(x-2)^2 + 5 = -31$
$-5 \quad -5$
$\frac{-3(x-2)^2}{-3} = \frac{-36}{-3}$
$\sqrt{(x-2)^2} = \sqrt{12}$
$x - 2 = \pm 2\sqrt{3}$
$+2 \quad +2$
$\boxed{x = 2 \pm 2\sqrt{3}}$

$\sqrt{12}$
$2 \quad 6$
$2 \quad 3$

16) $5(x+4)^2 + 20 = 10$
$-20 \quad -20$
$\frac{5(x+4)^2}{5} = \frac{-10}{5}$
$(x+4)^2 = -2$
negative
$\boxed{\emptyset}$

You Try #17 – 18!

17) $-4(x+2)^2 + 8 = 28$
$-8 \quad -8$
$\frac{-4(x+2)^2}{-4} = \frac{20}{-4}$
$(x+2)^2 = -5$
negative
$\boxed{\emptyset}$

18) $2(x-1)^2 - 3 = 13$
$+3 \quad +3$
$\frac{2(x-1)^2}{2} = \frac{16}{2}$
$\sqrt{(x-1)^2} = \sqrt{8}$
$x - 1 = \pm 2\sqrt{2}$
$+1 \quad +1$
$\boxed{x = 1 \pm 2\sqrt{2}}$

$\sqrt{8}$
$2 \quad 4$
$2 \quad 2$

10.2 Notes: Solving Quadratics by Factoring, Day 1

Objectives:

- Use the Zero-Product Property to solve equations.
- Solve quadratic equations by factoring.

Warm-Up: With your group or a partner to factor the expressions below. If needed, use your Ch 9 Notes.

A) $x^2 + 5x + 4$ add mult 2,2 1,4

$\boxed{(x+1)(x+4)}$

B) $a^2 - 9$

$\boxed{(a+3)(a-3)}$

C) $6y^2 - 9y$ GCF = 3y

$\boxed{3y(2y-3)}$

Exploration: Work with a partner or your group.

- Given that $ab = 0$. What must be true about a and/or b?

$a \cdot 0 = 0$ $0 \cdot b = 0$

one (or both) of them must = 0

- Given that $(x-2)(x+5) = 0$. What values of x make this equation true? Why?

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

$\boxed{x = 2}$ $\boxed{x = -5}$

additive inverse (opp sign)

Zero-Product Property	Let a and b be real numbers. If $ab = 0$, then $a = 0$ and/or $b = 0$

For #1 – 4: Solve each equation for x.

1) $x(x-6) = 0$

$\boxed{x = 0}$ $x - 6 = 0$ $\boxed{x = 6}$

2) $-2.5x(x+1) = 0$

$-2.5x = 0$ $\boxed{x = 0}$ $x + 1 = 0$ $\boxed{x = -1}$

3) $3(x-2)(5x+2) = 0$

$\boxed{x = 2}$

$5x + \cancel{2} = 0$
$-2 \quad -2$
$\frac{\cancel{5}x}{\cancel{5}} = \frac{-2}{5}$

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

You Try #4!

4) $4x(2x-3)(x-100) = 0$

$4x = 0$ $\boxed{x = 0}$

$2x - \cancel{3} = 0$
$+3 \quad +3$
$\frac{\cancel{2}x}{\cancel{2}} = \frac{3}{2}$
$\boxed{x = \frac{3}{2}}$

$x - \cancel{100} = 0$
$+100 \quad +100$
$\boxed{x = 100}$

Solving Quadratic Equations by Factoring	① Get a 0 on one side of the =. ② Factor. ③ Use the Zero-Product Property to solve.

Reminder: What are other names for the "solutions" of a quadratic equation?

x-intercepts, zeros, and roots

Examples 5 – 10: Solve each equation for the variable by factoring.

5) $x^2 + 3x - 10 = 0$ 1, 10 2, 5

$(x-2)(x+5)=0$

$\boxed{x=2 \quad x=-5}$

6) $0 = h^2 - 25$

$0=(h+5)(h-5)=0$

$\boxed{h=-5 \quad h=5}$

or

$\boxed{h=\pm 5}$

7) $a^2 - 10a + 25 = 0$ 1, 25 −5, −5

$(a-5)(a-5)=0$

$\boxed{a=5}$

You try #8 – 10!

8) $x^2 - 49 = 0$

$(x+7)(x-7)=0$

$x=-7 \quad x=7$

$\boxed{x=\pm 7}$

9) $b^2 + 2b + 1 = 0$

$(b+1)(b+1)=0$

$\boxed{b=-1}$

10) $0 = x^2 + 4x - 12$ 1, 12 −2, 6 3, 4

$0=(x+6)(x-2)$

$\boxed{x=-6 \quad x=2}$

Examples 11 – 13: Solve each equation for the variable by factoring. You Try #13!

11) $4x^2 + 8x = 0$ GCF: 4x

$4x(x+2)=0$

$\frac{4x}{4}=\frac{0}{4}$

$\boxed{x=0}$

$x+\cancel{2}=0$
$-\cancel{2} \quad -2$

$\boxed{x=-2}$

12) $-9x^2 + 6x = 0$ GCF = −3x

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

$\boxed{x=0}$

$3x-\cancel{2}=0$
$+\cancel{2} \quad +2$

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

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

13) $15x^2 + 3x = 0$ GCF = 3x

$3x(5x+1)=0$

$\boxed{x=0}$

$5x+\cancel{1}=0$
$-\cancel{1} \quad -1$

$5x=-1$

$\boxed{x=-\frac{1}{5}}$

Examples 14 – 19: Solve each equation for the variable by factoring. Reminder: look for the GCF first. Not all problems will have a GCF, but some will.

14) $2x^3 - 14x^2 - 36x = 0$

GCF: 2x

$2x(x^2 - 7x - 18) = 0$

1,18
2,9
3,6

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

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

15) $-10x^2 + 90 = 0$

GCF = −10

$-10(x^2 - 9) = 0$

$-10(x+3)(x-3) = 0$

$x = -3 \quad x = 3$

$\boxed{x = \pm 3}$

16) $6x^2 - 13x - 5 = 0$

1, 6x
2x, 3x
1, 5

$(2x - 1)(3x - 5) = 0$

$\boxed{x = \frac{1}{2}}$ $\boxed{x = \frac{5}{3}}$

17) $5x^2 - 20 = 0$

GCF = 5

$5(x^2 - 4) = 0$

$5(x+2)(x-2) = 0$

$x = -2 \quad x = 2$

$\boxed{x = \pm 2}$

18) $-3x^3 - 18x^2 - 24x = 0$

GCF: −3x

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

1,8
2,4

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

$\boxed{x = 0,\ x = -2,\ x = -4}$

19) $10x^2 - 3x - 1 = 0$

1,10
2,5
1,1

$(2x - 1)(5x + 1) = 0$

$\boxed{x = \frac{1}{2}}$ $\boxed{x = \frac{-1}{5}}$

20) Consider the equation $3x^2 - 12 = 0$. Solve this problem in two ways:

By factoring GCF = 3

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

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

$\boxed{x = -2 \mid x = 2}$

By square rooting (see the 10.1 Notes)

$3x^2 - \cancel{12} = 0$
$\quad\ \ \cancel{+12} \quad +12$

$\frac{\cancel{3}x^2}{\cancel{3}} = \frac{12}{3}$

$\sqrt{x^2} = \sqrt{4}$

$\boxed{x = \pm 2}$

Did you get the same answer with each method?

Yes!

21) Consider the equation $x^2 + 2x - 3 = 0$, which can be solved by factoring. Explain why this equation could *not* be solved by square rooting.

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

$\boxed{x = -3 \mid x = 1}$

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

Cannot isolate x when we have x^2 and x.

10.3 Notes: Solving Quadratics by Factoring, Day 2

Objectives:

- Use the Zero-Product Property to solve equations.
- Solve quadratic equations by factoring.
- Re-write equations so that they can be solved by factoring.

Writing Equations in Equivalent Forms	To solve an equation by factoring, the equation must be set equal to 0. If the equation is not set equal to 0, then it can be written in an equivalent form. To move a term from one side of the = sign to other side, cancel the term through + or − (the term will change signs!)
Standard Form of a Quadratic Equation	$ax^2 + bx + c = 0 \rightarrow 0 = ax^2 + bx + c$ easiest to factor if a is positive

Examples #1 – 6: Solve each equation by factoring.

1) $x^2 = -10x$
$+10x \quad +10x$
$x^2 + 10x = 0$ GCF = x
$x(x + 10) = 0$
$x = 0$ | $x = -10$

2) $x^2 + 40 = 14x$
$-14x \quad -14x$
$x^2 - 14x + 40 = 0$
1,40
2,20
−4,−10
5,8
$(x - 4)(x - 10) = 0$
$x = 4$ | $x = 10$

3) $x^2 = -9x - 18$
$+9x\ +18 \quad +9x\ +18$
$x^2 + 9x + 18 = 0$
1,18
2,9
3,6
$(x + 3)(x + 6) = 0$
$x = -3$ | $x = -6$

You Try #4 – 6!

4) $x^2 - 3x = 40$
$x^2 - 3x - 40 = 0$
1,40
2,20
4,10
5,8
$(x + 5)(x - 8) = 0$
$x = -5$ | $x = 8$

5) $x^2 = 8x + 9$
$x^2 - 8x - 9 = 0$
1,9
3,3
$(x + 1)(x - 9) = 0$
$x = -1$ | $x = 9$

6) $9x^2 = -6x$
$9x^2 + 6x = 0$
GCF = 3x
$3x(3x + 2) = 0$
$x = 0$ | $x = -\frac{2}{3}$

$\frac{3x}{3} = \frac{0}{3}$
$x = 0$

$3x + 2 = 0$
$-2 \quad -2$
$\frac{3x}{3} = \frac{-2}{3}$
$x = \frac{-2}{3}$

Examples #7 – 12: Solve each equation by factoring.

7) $3a = -a^2 + 10$

$+a^2 \; -10 \quad +a^2 \; -10$

$a^2 + 3a - 10 = 0$

1,10
-2,5

$(a-2)(a+5)=0$

$\boxed{a=2 \mid a=-5}$

8) $3b^2 + 18 = -21b$

$3b^2 + 21b + 18 = 0$

GCF = 3

$3(b^2 + 7b + 6) = 0$

1,6
2,3

$3(b+1)(b+6)=0$

$\boxed{b=-1 \mid b=-6}$

9) $-2x^2 - 15 = 11x$

$+2x^2 \; +15 \quad +2x^2 + 15$

$0 = 2x^2 + 11x + 15$

1x 2x   1,15   3,5

$0 = (x+3)(2x+5)$

$\boxed{x=-3 \mid x=-\frac{5}{2}}$

You Try #10 – 12!

10) $x^2 - 30 = x$

$x^2 - 1x - 30 = 0$

1,30
2,15
3,10
5,6

$(x+5)(x-6)=0$

$\boxed{x=-5 \mid x=6}$

11) $-2x^2 + 16x = 14$

$0 = 2x^2 - 16x + 14$

GCF = 2

$0 = 2(x^2 - 8x + 7)$

-1,7

$0 = 2(x-1)(x-7)$

$\boxed{x=1 \mid x=7}$

12) $3 = -2x^2 + 5x$

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

1,2   1,3

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

$\boxed{x=\frac{3}{2} \mid x=1}$

Examples #13 – 16: Solve each equation by factoring.

13) $3a^2 - 18a - 45 = 3$

$-3 \quad \cancel{-3}$

$3a^2 - 18a - 48 = 0$ GCF = 3

$3(a^2 - 6a - 16) = 0$

1,16
2,8
4,4

$3(a+2)(a-8)$

$\boxed{a=-2 \mid a=8}$

14) $49 = 4b^2$

$0 = 4b^2 - 49$

$0 = (2b+7)(2b-7)$

$b = -\frac{7}{2} \qquad b = \frac{7}{2}$

$\boxed{b = \pm\frac{7}{2}}$

You try #15 – 16!

15) $81 = 25y^2$

$0 = 25y^2 - 81$

$0 = (5y+9)(5y-9)$

$y = -\frac{9}{5} \qquad y = \frac{9}{5}$

$\boxed{y = \pm\frac{9}{5}}$

16) $-4x^2 + 14 = 8x + 2$

$-14 \quad -14$

$0 = 4x^2 + 8x + \underbrace{2 - 14}$

$0 = 4x^2 + 8x - 12$ GCF = 4

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

-1,3

$0 = 4(x-1)(x+3)$

$\boxed{x=1 \mid x=-3}$

1, 1

17) Consider the equation $x^2 - 3x + 1 = 0$.

- Can this equation be solved by square rooting? Why or why not?

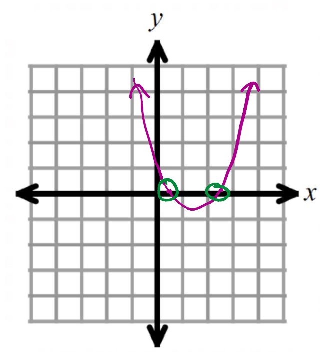
  No   cannot isolate x with an x^2 and an x term!

- Can this equation be solved by factoring? Why or why not?

  (x   )   No, Prime

  ?

- Use a graphing calculator or technology to graph $y = x^2 - 3x + 1$. Sketch the graph to the right.



- How many x-intercepts does this quadratic function have? ___2___ So how many solutions should the equation have? ___2___
- Note: we will learn another method next class that could be used to solve this equation.

10.4 Notes: The Quadratic Formula

Objectives

- Use the Quadratic Formula to solve quadratic equations.
- Determine when a quadratic equation has no solution.

The Quadratic Formula	if $ax^2 + bx + c = 0$ then $\boxed{x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}}$ the opposite of b
When can the Quadratic Formula be used?	any time in the form $ax^2 + bx + c = 0$

For Examples #1 – 4, solve each equation for *x* by using the quadratic formula. If needed, write your answers as simplified radicals.

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

$a = 1 \quad b = -5 \quad c = 2$

$x = \dfrac{5 \pm \sqrt{25 - 4(1)(2)}}{2(1)}$

$x = \boxed{\dfrac{5 \pm \sqrt{17}}{2}}$

2) $x^2 + 9 = 9x$

$1x^2 - 9x + 9 = 0$

$a = 1 \quad b = -9 \quad c = 9$

$x = \dfrac{9 \pm \sqrt{81 - 4(1)(9)}}{2(1)}$

$x = \dfrac{9 \pm \sqrt{45}}{2}$

$\boxed{x = \dfrac{9 \pm 3\sqrt{5}}{2}}$

$\sqrt{45}$: 5, 9; 3, 3

You try #3 – 4!

3) $x^2 + 5x = 3$

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

$a = 1 \quad b = 5 \quad c = -3$

$x = \dfrac{-5 \pm \sqrt{25 - 4(1)(-3)}}{2(1)}$

$x = \boxed{\dfrac{-5 \pm \sqrt{37}}{2}}$

4) $x^2 + 5x - 5 = 0$

$a = 1 \quad b = 5 \quad c = -5$

$x = \dfrac{-5 \pm \sqrt{25 - 4(1)(-5)}}{2(1)}$

$x = \dfrac{-5 \pm \sqrt{45}}{2} = \boxed{\dfrac{-5 \pm 3\sqrt{5}}{2}}$

$\sqrt{45}$: 5, 9; 3, 3

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

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

For Examples 5 – 8, solve each equation for *x* by using the quadratic formula. If needed, write your answers as simplified radicals.

$\sqrt{neg}$

$\varnothing$

5) $5x^2 + 3x - 9 = 0$

$a=5 \quad b=3 \quad c=-9$

$x = \frac{-3 \pm \sqrt{9 - 4(5)(-9)}}{2(5)}$

$x = \frac{-3 \pm \sqrt{189}}{10}$

$\sqrt{189}$: 3, 63; 3, 21; 3, 7

$\boxed{x = \frac{-3 \pm 3\sqrt{21}}{10}}$

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

$a=5 \quad b=3 \quad c=2$

$x = \frac{-3 \pm \sqrt{9 - 4(5)(2)}}{2(5)}$

$x = \frac{-3 \pm \sqrt{-31}}{10}$

$= \boxed{\varnothing}$

You try #7 – 8!

7) $x^2 + 3 = 4x$

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

$a=1 \quad b=-4 \quad c=3$

$x = \frac{4 \pm \sqrt{16 - 4(1)(3)}}{2(1)}$

$x = \frac{4 \pm \sqrt{4}}{2} = \frac{4 \pm 2}{2}$

$\frac{4+2}{2} = \frac{6}{2} = \boxed{3}$

$\frac{4-2}{2} = \frac{2}{2} = \boxed{1}$

8) $4x^2 - 1x + 20 = 0$

$a=4 \quad b=-1 \quad c=20$

$x = \frac{1 \pm \sqrt{1 - 4(4)(20)}}{2(4)}$

$x = \frac{1 \pm \sqrt{-319}}{8} \rightarrow \boxed{\varnothing}$

For Examples 9 – 10, solve each equation for *x* by using the quadratic formula. If needed, write your answers as simplified radicals.

9) $3x^2 - 2 = -10x$

$3x^2 + 10x - 2 = 0$

$a=3 \quad b=10 \quad c=-2$

$x = \frac{-10 \pm \sqrt{100 - 4(3)(-2)}}{2(3)}$

$\sqrt{124}$: 2, 62; 2, 31

$x = \frac{-10 \pm \sqrt{124}}{6}$

$x = \frac{(-10 \pm 2\sqrt{31}) \div 2}{6 \div 2} = \boxed{\frac{-5 \pm \sqrt{31}}{3}}$

You try!

10) $2x^2 - 6x - 5 = 0$

$a=2 \quad b=-6 \quad c=-5$

$x = \frac{6 \pm \sqrt{36 - 4(2)(-5)}}{2(2)}$

$\sqrt{76}$: 2, 38; 2, 19

$x = \frac{6 \pm \sqrt{76}}{4}$

$x = \frac{(6 \pm 2\sqrt{19}) \div 2}{(4) \div 2} = \boxed{\frac{3 \pm \sqrt{19}}{2}}$

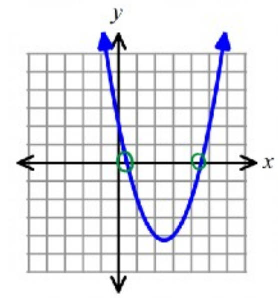
Example 11: Consider the function $y = x^2 - 5x + 2$

a) From #1 in this lesson, you had solved $x^2 - 5x + 2 = 0$ for x by using the quadratic equation. Write down the answers you had gotten from this problem here:

$\frac{5 \pm \sqrt{17}}{2} \rightarrow \frac{5 + \sqrt{17}}{2}$ and $\frac{5 - \sqrt{17}}{2}$

b) Use a calculator to convert these solutions for x to decimals rounded to the nearest tenth.

≈ 4.6 and ≈ 0.4



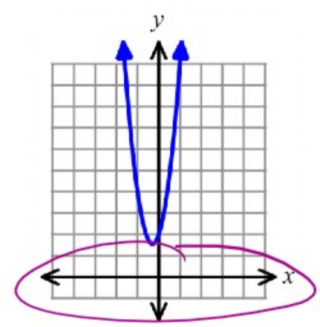
c) The graph of the function $y = x^2 - 5x + 2$ is shown to the right.
What did you find when you solved this equation for x?

x - intercepts

Example 12: Consider the function $y = 5x^2 + 3x + 2$

a) From #6 in this lesson, you had solved $5x^2 + 3x + 2 = 0$ for x by using the quadratic equation. Write down the answers you had gotten from this problem here:

$\emptyset$



b) The graph of the function $y = 2x^2 - 2x + 4$ is shown to the right.
What did you find when you solved this equation for x?

x-intercepts
(none!)

Ch 10 Study Guide: Solving Quadratics

Technique	Hints and Steps	Read about it in your notes!
Solving by Square Rooting $ax^2 + c = \text{constant}$ $a(x-h)^2 + k = \text{constant}$	• Cancel c or k by adding or subtracting from both sides • Divide both sides by a. • Square root both sides ($\pm$) • If the variable is not isolated, then add or subtract h from both sides. • Reminder: $x^2 \neq$ negative… if it does, then there is *no solution.*	Section 10.1
Solving by Factoring $ax^2 + bx + c = 0$ $ax^2 + c = 0$	• Get a 0 on one side of the equation. • Factor completely. • Set each factor = 0 and solve by using the Zero Product Property.	Sections 10.2 and 10.3
Solving by the Quadratic Formula $ax^2 + bx + c = 0$	• Get a 0 on one side of the equation. • Use $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ • Reminder: $\sqrt{\text{negative}}$ means there is *no solution.*	Section 10.4