

Notes: Week 12 - Week 16

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Lesson One

11/05/2020 Solve By Graphing Continued

• I can solve quadratic equations.

* Graph first then name the solutions

Key points:

From vertex (x, y)

↳ over 1, up $1 \cdot a$

↳ over 2, up $4 \cdot a$

↳ over 3, up $9 \cdot a$

* If a is negative, then up changes to down

Examples

1) Graph and name solutions

standard Form

$$ax^2 + bx + c$$

$$x^2 + 2x - 8$$

$$a=1 \quad b=2 \quad c=-8$$

f.o.s

$$x = -1$$

int:

$$-8$$

vertex:

$$(-1, -9)$$

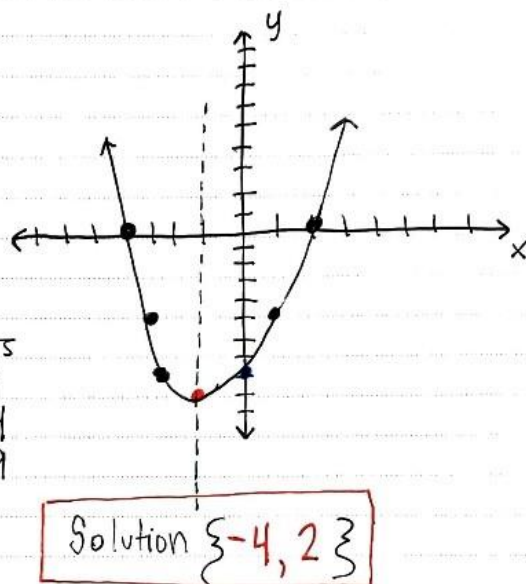
x, y

Key Points

- over 1, up 1

- over 2, up 4

- over 3, up 9



11/05/2020 Solve By Graphing Continued

- I can solve quadratic equations.

* Graph first then name the solutions

Key points:

From vertex (x, y)

↳ over 1, up $1 \cdot a$

↳ over 2, up $4 \cdot a$

↳ over 3, up $9 \cdot a$

* If a is negative, then up changes to down

Examples

$$ax^2 + bx + c$$

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

$$a = -2 \quad b = 4 \quad c = -5$$

f.o.s:

$$x = 1$$

Intercept:

$$-5$$

Vertex:

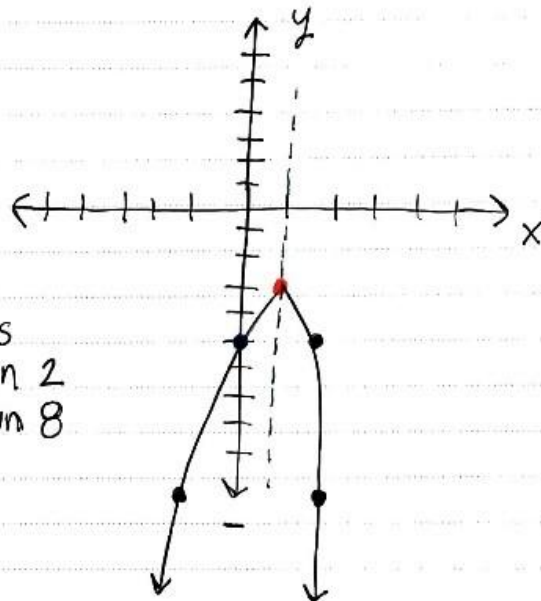
$$(1, -3)$$

x y

Key points

- over 1, down 2

- over 2, down 8



Solution

No real
Solution

Lesson 2

11/12/2020 Evaluating Radical Expressions

• ~~I~~ can evaluate radical expressions

* You need a pair to break out * $\sqrt{\quad}$
 * write the pair ONE time *

Examples

① $\sqrt{40}$
 $\wedge$
~~4~~ · ~~10~~
 $\wedge$ $\wedge$
~~2~~ · ~~2~~ ~~2~~ · ~~5~~
 $\downarrow$ $\downarrow$
 $2\sqrt{2 \cdot 5}$
 $\boxed{2\sqrt{10}}$

② $\sqrt{21}$
 $\wedge$
 $7 \cdot 3$
 $\downarrow$
 $\sqrt{7 \cdot 3}$
 $\boxed{\sqrt{21}}$

③ $\sqrt{64}$
 $\wedge$
 $8 \cdot 8$
 $\downarrow$
 $\boxed{8}$

Variables w/ Exponents :

$$a^4 = a \cdot a \cdot a \cdot a$$

$$b^3 = b \cdot b \cdot b$$

$$c^6 = c \cdot c \cdot c \cdot c \cdot c \cdot c$$

D) $\sqrt{24}$
 $\wedge$
~~2~~ · ~~12~~
 $\wedge$
~~3~~ · ~~4~~
 $\wedge$
~~2~~ · ~~2~~
 $\downarrow$
 $2\sqrt{2 \cdot 3}$
 $\boxed{2\sqrt{6}}$

⑤ $\sqrt{a^4 b^3 c^6}$
 $\downarrow$
 $a \cdot a \cdot a \cdot a = a^2$
 $b \cdot b \cdot b = b$
 $c \cdot c \cdot c \cdot c \cdot c \cdot c = c^3$
 $\boxed{a^2 b c^3 \sqrt{b}}$

11/13/2020 Radical Expressions Continued

• I can simplify expressions containing radicals

* Need a pair to break out *

* write each pair ONE time *

* Multiply only like terms *

Examples:

① $\sqrt{52}$

$2 \cdot 26$
 $2 \cdot 13$

$2\sqrt{13}$

② $\sqrt{45a^4b^5}$

$5 \cdot 9$
 $3 \cdot 3$

$a \cdot a \cdot a \cdot a = a^4$
 $b \cdot b \cdot b \cdot b \cdot b = b^5$

$3a^2b^2\sqrt{5b}$

Multiplying Radicals

③ $2\sqrt{12} \cdot 5\sqrt{10}$

$10\sqrt{120}$
 $12 \cdot 10$
 $3 \cdot 4$
 $2 \cdot 5$
 $2 \cdot 2$

$10 \cdot 2 \sqrt{3 \cdot 2 \cdot 5}$

$20\sqrt{30}$

④ $3\sqrt{10} \cdot 4\sqrt{24}$

$12\sqrt{240}$
 $10 \cdot 24$
 $5 \cdot 2$
 $2 \cdot 2$
 $3 \cdot 4$
 $2 \cdot 2$

$12 \cdot 2 \cdot 2 \sqrt{5 \cdot 3}$

$48\sqrt{15}$

Lesson 3

11/17/2020 Quadratic Formula

• I can solve quadratic functions

Quadratic Formula:

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

Standard Form

$$ax^2 + bx + c = 0$$

Examples: * Set equation = 0

①

$$x^2 - 2x = 35$$

-35 -35

$$\rightarrow x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-35)}}{2(1)}$$

$$x^2 - 2x - 35 = 0$$

$$a = 1 \quad b = -2 \quad c = -35$$

$$x = \frac{2 \pm \sqrt{4 + 140}}{2}$$

$$x = \frac{2 \pm \sqrt{144}}{2}$$

{7, -5}

$$x = \frac{2 \pm 12}{2}$$

$$x = \frac{2+12}{2}$$

$$x = \frac{2-12}{2}$$

Lesson 4

12/01/2020 Solving Quadratic Equations

Review: ALL WAYS

- I can solve quadratic equations

Solve a quadratic by Factoring

Ex1) $4x^2 - 8x + 3 = 0$

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

$$(x - \frac{-2}{4})(x - \frac{-6}{4}) = 0$$

$$(x - \frac{1}{2})(x - \frac{3}{2}) = 0$$

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

$$\begin{array}{l} 2x - 1 = 0 \\ +1 \quad +1 \\ \hline 2x = 1 \\ \frac{2x}{2} = \frac{1}{2} \\ x = \frac{1}{2} \end{array}$$

$$\begin{array}{l} 2x - 3 = 0 \\ +3 \quad +3 \\ \hline 2x = 3 \\ \frac{2x}{2} = \frac{3}{2} \\ x = \frac{3}{2} \end{array}$$

multiply

$$\begin{array}{r} +12 \\ -2 \quad -6 \\ \hline -8 \\ \text{add} \end{array}$$

slide
divide
bottoms up

$$\begin{array}{r} 12 \\ -1 \quad -12 \\ \hline -2 \cdot -6 = 12 \\ -2 + -6 = -8 \end{array}$$

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

12/01/2020 Solving Quadratic Equations
Review: ALL WAYS

- I can solve quadratic equations

Solve a quadratic by Quadratic Formula

$$X = \frac{-b \pm \sqrt{(b)^2 - 4ac}}{2a}$$

Ex2) $ax^2 + bx + c$
 $5x^2 - 6x + 7 = 0$
 $a = 5 \quad b = -6 \quad c = 7$

$$X = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(5)(7)}}{2(5)}$$

$$X = \frac{6 \pm \sqrt{36 - 140}}{10}$$

$$X = \frac{6 \pm \sqrt{-104}}{10}$$

NO real
solutions

12/01/2020 Solving Quadratic Equations

Review: ALL WAYS

- I can solve quadratic equations

Solve a quadratic by graphing

Ex 3)

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

$a = 1$ $b = -2$ $c = -3$ ← y-intercept

Axis of Symmetry: $x = -\frac{b}{2a}$

$$x = \frac{-(-2)}{2(1)}$$

$$x = \frac{-(-2)}{2}$$

$$x = -(-1)$$

$$x = 1$$

y-int: -3

Vertex: $(-\frac{b}{2a}, \text{plugging in } x)$

$(1, -4)$

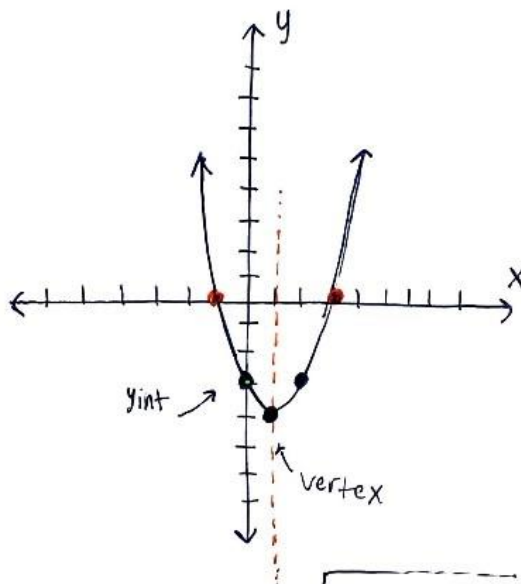
$$x^2 - 2x - 3$$

$$(1)^2 - 2(1) - 3$$

$$1 - 2 - 3$$

$$-1 - 3$$

$$-4$$



$$\{-1, 3\}$$

Lesson 5

12/03/2020 Adding and Subtracting Radicals

• I can simplify expressions containing radicals.

Ex 1)

$$6\sqrt{5} + \sqrt{5} - 5\sqrt{5}$$

$$(6+1-5)\sqrt{5}$$

$$(7-5)\sqrt{5}$$

$$\boxed{2\sqrt{5}}$$

You can only
add or subtract
radicals with the
same number
on the inside.

Ex 2)

$$\underline{7}\sqrt{2} + \underline{8}\sqrt{11} - \underline{4}\sqrt{11} - \underline{6}\sqrt{2}$$

$$(7-6)\sqrt{2} + (8-4)\sqrt{11}$$

$$\boxed{1\sqrt{2} + 4\sqrt{11}}$$

Ex 3)

$$\begin{array}{ccc} 6\sqrt{27} & + & 8\sqrt{12} & + & 2\sqrt{75} \\ \downarrow & \uparrow & \downarrow & \uparrow & \downarrow & \uparrow \\ & 3 \cdot 3 & & 4 \cdot 3 & & 3 \cdot 5 \\ & \textcircled{3 \cdot 3} & & \textcircled{2 \cdot 2} & & \textcircled{5 \cdot 5} \\ 6 \cdot 3\sqrt{3} & & 8 \cdot 2\sqrt{3} & & 2 \cdot 5\sqrt{3} \end{array}$$

$$18\sqrt{3} + 16\sqrt{3} + 10\sqrt{3}$$

$$(18+16+10)\sqrt{3} = \boxed{44\sqrt{3}}$$