

warm up

WEEK 7

Solve

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

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

$$x-2=0$$

$$x=2$$

$$x-2=0$$

$$x=2$$

$$x-3=0$$

$$x=3$$

2) $3(x - 1)(x + 325) = 0$

$$3 \neq 0$$

$$x-1=0$$

$$x=1$$

$$x+325=0$$

$$x = -325$$

3) $x(x - 1.23) = 0$

$$x=0$$

$$x-1.23=0$$

$$+1.23 \quad +1.23$$

$$x=1.23$$

Homework Questions?

Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

0- I *can't* apply the concepts even with help.

Review Sheet

10.4 Solving Polynomial Equations in Factored Form

- Goals:**
- Solve a polynomial equation in factored form.
 - Relate factors and x-intercepts

EQ: How do you find x-intercepts in factored form?

Algebra 1.5		←	→
② LAST UNIT/Experience Quadratic Equations	① CURRENT UNIT Polynomials & Factoring		③ NEXT UNIT/Experience Rational Equations
⑧ Student Activities or Assignments	⑤ UNIT MAP		
<ol style="list-style-type: none"> 1. 10.1 2. 10.2 3. 10.3 4. 10.4 5. 10.5 6. 10.6 7. 10.7 8. 10.8 			
⑦ UNIT SELF-TEST QUESTIONS	<ol style="list-style-type: none"> 1. When adding & subtracting polynomials, how do you combine like terms? 2. How do you use distributive property, FOIL, and diagrams to multiply polynomials? 3. What is the method for factoring trinomials? 4. How is factoring & the Zero-Product Property used to solve polynomials? 		⑥ UNIT RELATIONSHIPS Factor Solve Calculate Simplify

FACTORS, SOLUTIONS, AND X-INTERCEPTS

For any quadratic polynomial $ax^2 + bx + c$, if one of the following statements is true, then all three statements are true.

- $(x - p)$ is a factor of the quadratic expression $ax^2 + bx + c$.

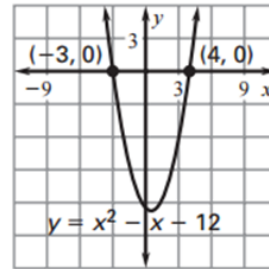
Example: $(x - 4)$ and $(x + 3)$ are factors of $x^2 - x - 12$.

- $x = p$ is a solution of the quadratic equation $ax^2 + bx + c = 0$.

Example: $x = \underline{3}$ and $x = \underline{4}$ are solutions of $x^2 - x - 12 = 0$.

- p is an x -intercept of the graph of the function $y = ax^2 + bx + c$.

Example: $\underline{-3}$ and $\underline{4}$ are x -intercepts of $y = x^2 - x - 12$.



① x -intercepts
= 0

x ② Avg. (mean)
of x -intercepts

y ③ sub in original eqn

Example 4: Relating x-Intercepts and Factors

Sketch the graph of $y = (x - 3)(x + 7)$:

x-int

$$0 = (x - 3)(x + 7)$$

$$\begin{array}{l} x - 3 = 0 \\ +3 \quad -3 \end{array} \qquad \begin{array}{l} x + 7 = 0 \\ -7 \quad +7 \end{array}$$

$$\boxed{x = 3} \qquad \boxed{x = -7}$$

Vertex

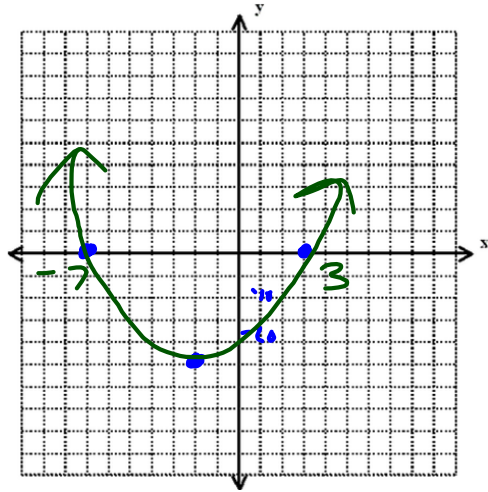
$$x = \frac{3 + (-7)}{2} = \frac{-4}{2} = \boxed{-2}$$

$$y = (-2 - 3)(-2 + 7)$$

$$= -5(5)$$

$$y = -25$$

Vertex: $\boxed{(-2, -25)}$



Example 5: Using a Quadratic Model

An opening to a cave can be modeled by the equation $y = -\frac{5}{9}(x + 3)(x - 3)$, with x and y measured in feet. How wide is the opening at the base? How high is the opening? (sketch a graph of the model)

x-int

$$0 = -\frac{5}{9}(x + 3)(x - 3)$$

$$\begin{array}{l} x + 3 = 0 \\ -3 \quad -3 \end{array} \qquad \begin{array}{l} x - 3 = 0 \\ +3 \quad +3 \end{array}$$

$$\boxed{x = -3} \qquad \boxed{x = 3}$$

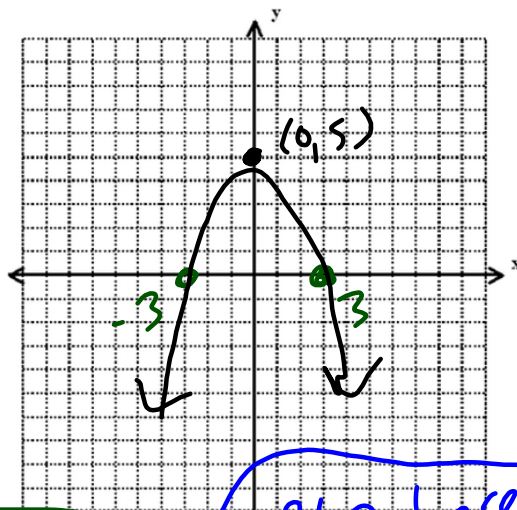
Vertex

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

$$y = -\frac{5}{9}(0 + 3)(0 - 3)$$

$$\boxed{y = 5} = -\frac{5}{9}(3)(-3)$$

Vertex $\boxed{(0, 5)}$



6ft @ base
5ft high

Try It

Complete the following exercises.

3. Find the x-intercepts of the function $y = (x + 6)(x + 1)$.

$$\begin{array}{l} x+6=0 \\ -6-6 \\ \hline X=-6 \end{array} \quad \begin{array}{l} x+1=0 \\ -1-1 \\ \hline X=-1 \end{array}$$

4. A tunnel entrance can be modeled by the equation $y = -\frac{5}{16}(x + 8)(x - 8)$, with x and y measured in feet. How wide is the tunnel at the base? How high is the tunnel?

16 ft wide @ base
20 ft high

x-int
 $0 = -\frac{5}{16}(x+8)(x-8)$

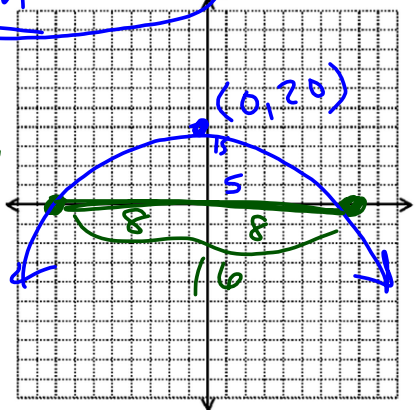
$$\begin{array}{l} x+8=0 \\ -8-8 \\ \hline X=-8 \end{array} \quad \begin{array}{l} x-8=0 \\ +8+8 \\ \hline X=8 \end{array}$$

Vertex
 $x = \frac{-8+8}{2} = \frac{0}{2} = 0$

$$\begin{aligned} y &= -\frac{5}{16}(0+8)(0-8) \\ &= -\frac{5}{16}(8)(-8) \end{aligned}$$

$y = 20$

vertex: (0, 20)



10.4 Day 2 Homework

10.4 Day 2

p.601 #44-56

& Finish "X" wksts