Virtual Learning

9-12th Essential Math Unit 10

Lesson 5: Zero Product Property

April 27, 2020

Essential Math 4

Essentials Math 4
Lesson 5: April 27, 2020

Learning Target:

I can solve algebraic equations using different methods.

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You will explore the use of area models to factor algebraic expressions and solve for the zeros.

Directions:

1. Click through the slides.
2. Watch all videos on slides.
3. Do what each slide asks on a separate sheet of paper.

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Bell Work
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Solve:

1. $x - 5 = 11$

2. $2y + 1 = 13$

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Bell Work Answer Key April 27, 2020

1. $x - 5 = 11$

$+5 \quad +5$

$x = 16$

2. $2y + 1 = 13$

$-1 \quad -1$

$\frac{2y}{2} = \frac{12}{2}$

$y = 6$

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Practice Problems
Solve the following:

(14) $t - 1 = 0$

$t =$ _____

(15) $b(n + 2) = 0$

$n =$ _____ or $b =$ _____

(16) $(x + 3)x = 0$

$x =$ _____ or _____

Practice Problems Key:

(14) $t - 1 = 0$

$t =$ 1

(15) $b(n + 2) = 0$

$n =$ -2 or $b =$ 0

or both = 0

(16) $(x + 3)x = 0$

$x =$ -3 or 0

Thinking Out Loud

Michael: Hang on! Look at problem 16. Can x really equal two things?

Lena: It's not *both*; it's *either*. It says "or." We can use either answer in the equation and see that it works.

If $x = 0$, then *(Lena writes as she talks)*, $(x + 3)x = (0 + 3) \cdot 0$, which is $3 \cdot 0$, which is 0.

Michael: So that works. And if $x = -3$ *(Michael writes as he talks)*, then $(x + 3)x = (-3 + 3)(-3) = 0 \cdot -3$, which is 0 again! They *do* both work!

Lena: Do you think there could be other solutions, too?

Michael: No, I don't think so. These are the *only* two that work because… *(The bell rings.)*

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Discuss & Write What You Think

(17) What might Michael have said if the bell hadn't rung?

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Discuss & Write What You Think

(17) What might Michael have said if the bell hadn't rung?

If x is zero, that's one solution. If x is not 0, then the only way (x + 3)x can be 0 is if (x + 3) is 0. So either x or (x + 3) must be zero.

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Practice Problems: Unit 10 Lesson 5 (page 26, 18-20)

18 $(b+2)(b+3)=0$

$b =$ _____ or _____

19 $(r+1)(r-4)=0$

$r =$ _____ or _____

20 $(x+3)(x-3)=0$

$x =$ _____ or _____

Answer Key:

Once you have completed the problems, check your answers for page 26 here.

18 $(b+2)(b+3)=0$

$b =$ -2 or -3

19 $(r+1)(r-4)=0$

$r =$ -1 or 4

20 $(x+3)(x-3)=0$

$x =$ -3 or 3

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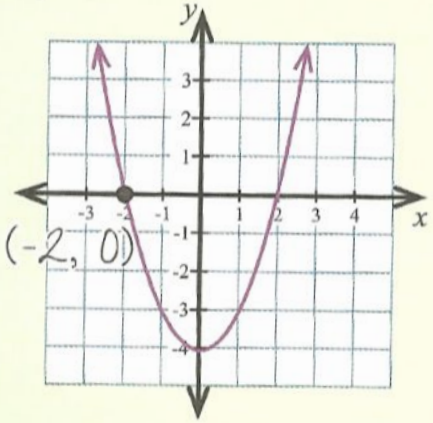
Practice Problems: Unit 10 Lesson 5 page 26, 21-23

Malika noticed a connection between the graph of $y = (x + 2)(x - 2)$ and the two solutions of $(x + 2)(x - 2) = 0$. She saw that the solutions appear on the graph where $y = 0$. Mark the two points on each graph where $y = 0$ and use these points to solve the equations below.

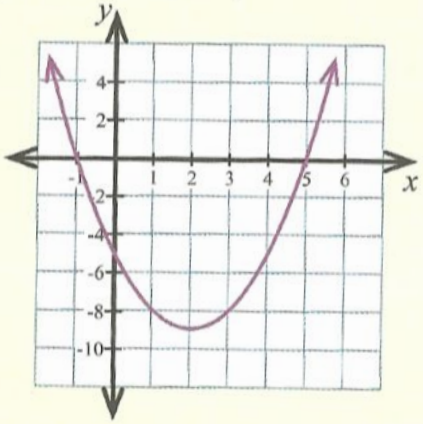
(21) $y = (x + 2)(x - 2)$



Solve: $(x + 2)(x - 2) = 0$

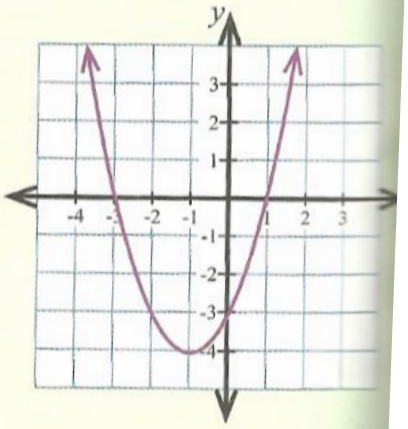
$x =$ ____ or ____

(22) $y = (x + 1)(x - 5)$



Solve: $(x + 1)(x - 5) = 0$

(23) $y = x^2 + 2x - 3$



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

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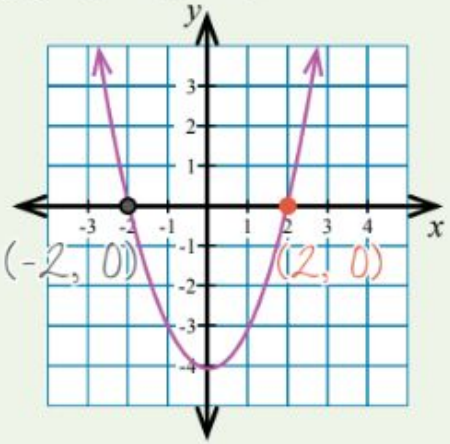
Answer Key:

Once you have completed the problems, check your answers for the previous slide.

Malika noticed a connection between the graph of $y = (x + 2)(x - 2)$ and the two solutions of $(x + 2)(x - 2) = 0$. She saw that the solutions appear on the graph where $y = 0$. Mark the two points on each graph where $y = 0$ and use these points to solve the equations below.

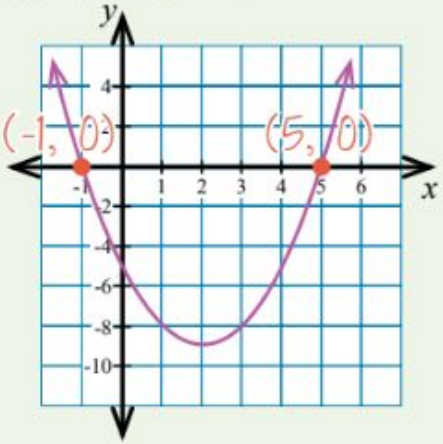
21 $y = (x + 2)(x - 2)$



Solve: $(x + 2)(x - 2) = 0$

$x =$ -2 or 2

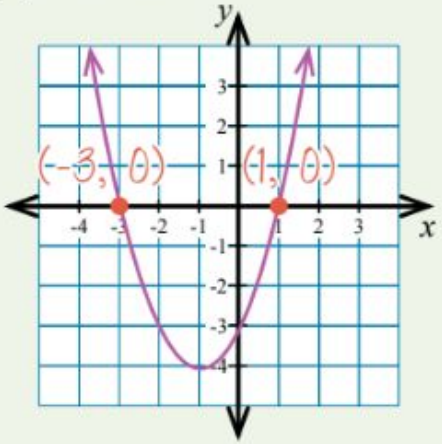
22 $y = (x + 1)(x - 5)$



Solve: $(x + 1)(x - 5) = 0$

$x = -1$ or 5

23 $y = x^2 + 2x - 3$



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

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

$x = -3$ or 1

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Just for fun!

Who Am I?

h	t	u

- At least one of my digits is odd.
- The product of my digits is 0.
- $h + t = 10$
- t is four more than h.
- $h(u + t) = 21$.

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Just for fun!

Key

Who Am I?

h	t	u
3	7	0

- At least one of my digits is odd.
- The product of my digits is 0.
- $h + t = 10$
- t is four more than h.
- $h(u + t) = 21$.

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transition to algebra
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