Day 2: Factoring to Solve a Quadratic

Date_____

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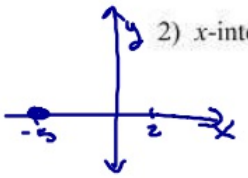
Zeros vs *x*-intercepts

1) Zeros: Equation

$0 =$

X: -5, 2



2) x-intercepts: Graph, Coord. Point

(-5, 0) & (2, 0)

Finding the zeros or *x*-intercepts of a quadratic function from Factored Form.

3) Remember the zero product property: if $ab = 0$ then $a = 0$, $b = 0$ or both a and b are 0.

This means that if $(x + 5)(x - 2) = 0$ then $x + 5 = 0$ and/or $x + 2 = 0$.

-5

In order to use factoring to solve and graph your quadratic we do the following:

a) Change y to $y = 0$.

*When solving for zeros or x-intercepts, $y = 0$.

b) Factor the quadratic equation.

c) Solve for x.

Find the zeros of each quadratic function from Factored Form.

4) $y = (x + 3)(x - 6)$

$0 = (-3+3)(-3-6)$

0

$0 = (6+3)(6-6)$

0

X: -3, 6

5) $y = (7x - 8)(x - 7)$

7 7

X: $\frac{8}{7}$, 7

$(7x - 8)$

$(7(\frac{8}{7}) - 8)$

6) $y = (8x - 7)(5x + 4)$

8 8 5 5

X: $\frac{7}{8}$, $\frac{-4}{5}$

7) $y = (x - 7)(x - 4)$

X: 7, 4

8) $y = (5x + 2)(x - 5)$

5 5

X: $\frac{-2}{5}$, 5

9) $y = (x + 7)(x + 2)$

↓ ↓

-7 -2

X: -7, -2

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$0 = 25 - 45 + 20$

$0 = 16 - 36 + 20$

Find the zeros of each quadratic function by factoring.

10) $y = x^2 - 9x + 20$

20: 1 20, 2 10, 4 5

$(x-4)(x-5)$

X: 4, 5

11) $y = x^2 + 6x + 8$

$(x+2)(x+4)$

$-2 \quad -4$

X: -2, -4

12) $y = x^2 + 3x + 2$

2: 1 2

$(x+1)(x+2)$

X: -1, -2

13) $y = x^2 - 4$

$(x+2)(x-2)$

X: 2, -2

14) $y = x^2 - 7x + 12$

$(x-3)(x-4)$

$3 \quad 4$

X: 3, 4

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

$(x+3)(x+1)$

X: -1, -3

16) $y = x^2 - 8x + 7$

$(x-7)(x-1)$

$7 \quad 1$

X: 7, 1

17) $y = 4x^2 - 16x + 16$

$\frac{4}{4} \quad \frac{16}{4} \quad \frac{16}{4}$

$4(x^2 - 4x + 4)$

$4(x-2)(x-2)$

4: 1 4, 2 2

X: 2

18) $y = -4x^2 + 24x$

$\frac{-4x}{-4x} \quad \frac{24x}{-4x}$

$-4x(x-6)$

$0 \quad 6$

X: 0, 6

19) $y = x^2 - 1$

$(x+1)(x-1)$

X: -1, 1

20) $y = x^2 + 8x + 16$

$(x+4)(x+4)$

$-4 \quad -4$

X: -4

21) $y = x^2 - 4$

$(x+2)(x-2)$

$-2 \quad 2$

X: -2, 2

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(x, 0)

Find the *x*-intercepts from Factored Form.

22) $y = (x + 6)(x + 4)$

(-6, 0) and (-4, 0)

23) $y = (x + 7)(x - 1)$

(-7, 0) and (1, 0)

24) $y = (x + 5)(8x - 3)$

(-5, 0) and $(\frac{3}{8}, 0)$

25) $y = (x + 2)(5x + 3)$

-2 $-\frac{3}{5}$

$(-2, 0)$ & $(-\frac{3}{5}, 0)$

Find the *x*-intercepts by factoring.

26) $y = x^2 + x - 2$

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

-2 1

$(-2, 0)$ & $(1, 0)$

27) $y = x^2 - 12x + 32$

$(x - 4)(x - 8)$

4 8

$(4, 0)$ & $(8, 0)$

32: 1, 32; 2, 16; 4, 8

28) $y = x^2 - 4x$

$x(x - 4)$

0 4

$(0, 0)$ & $(4, 0)$

29) $y = x^2 - 3x + 2$

$(x - 2)(x - 1)$

2 1

$(2, 0)$ & $(1, 0)$

30) $y = x^2 - 7x - 8$

$(x - 8)(x + 1)$

8: 1, 8; 2, 4

X: +8, -1 $(+8, 0), (-1, 0)$

31) $y = x^2 + 3x + 2$

$(x + 1)(x + 2)$

-1 -2

$(-1, 0)$ & $(-2, 0)$

32) $y = x^2 - 9x + 20$

$(x - 4)(x - 5)$

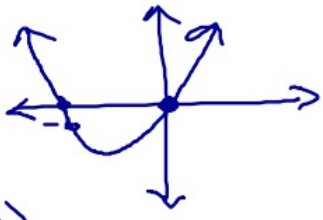
4 5

$(4, 0)$ & $(5, 0)$

33) $y = x^2 + 6x + 0$

$x(x + 6)$

$(0, 0)$ & $(-6, 0)$



34) $y = x^2 + 8x + 16$

35) $y = x^2 - 10x + 24$

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