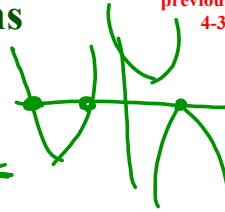


4-3C Solving Quadratic Equations by Factoring

previous assignment:
4-3B Worksheet

- write equations in standard form.
- write equations in factored form.
- solve quadratic equations by factoring.
- A.SSE.2, F.IF.8a

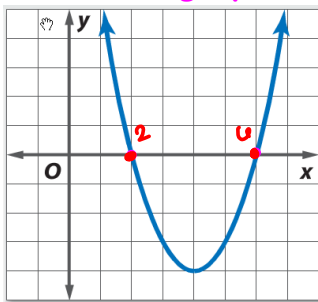
$$y = ax^2 + bx + c$$



standard form: $ax^2 + bx + c = 0$

factored form: $a(x - p)(x - q) = 0$, where p and q represent the **x-intercepts** of the graph of the equation

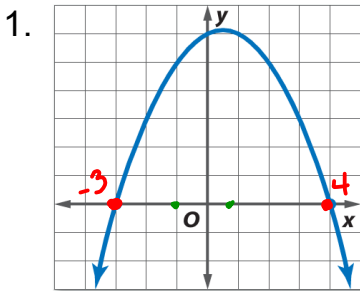
related graph



factored form: $(x - 2)(x - 6) = 0$
 $x^2 - 6x - 2x + 12 = 0$

standard form: $x^2 - 8x + 12 = 0$

Write the factored form and standard form the following quadratic equations described below.



FF: $(x + 3)(x - 4) = 0$

$x^2 - 4x + 3x - 12 = 0$

SF: $-x^2 + x + 12 = 0$

2. Solutions of $\frac{2}{3}$ and -1

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

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

$x = -1$

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

$(3x - 2) = 0$

FF: $(3x - 2)(x + 1) = 0$

FF: $\frac{1}{3} \cdot (x - \frac{2}{3})(x + 1) = 0 \cdot \frac{1}{3}$

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

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

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

Zero Product Property: For any real numbers a and b , if $ab = 0$, then either $a = 0$ or $b = 0$. (ZPP)

$$\begin{array}{l} \underline{0} \times \underline{\quad} = 0 \\ \underline{\quad} \times \underline{0} = 0 \\ 0 \times 0 = 0 \end{array} \quad \frac{2x}{2} = \frac{0}{2} \quad 2x = 0$$

$$\cancel{2} \text{ or } x = 0$$

$$2(x+1) = 0 \quad x(x-3) = 0$$

$$\cancel{2} \text{ or } x+1 = 0 \quad x = 0 \text{ or } x-3 = 0$$

$$x = -1 \quad \{0, 3\}$$

$$2(3x+5)(x-4) = 0$$

$$3x+5 = 0 \text{ or } x-4 = 0$$

$$3x = -5 \quad x = 4$$

$$x = -\frac{5}{3} \quad \{-\frac{5}{3}, 4\}$$

To Solve by factoring:

- equation must be equal to **zero**. *inverse operations*
- equation must be written as a **product**. *factor.*
- use the **Zero Product** Property to solve.

$$(\quad) = 0 \text{ or } (\quad) = 0$$

Solve the following quadratic equations by factoring.

1. $m^2 - 3m - 28 = 0$

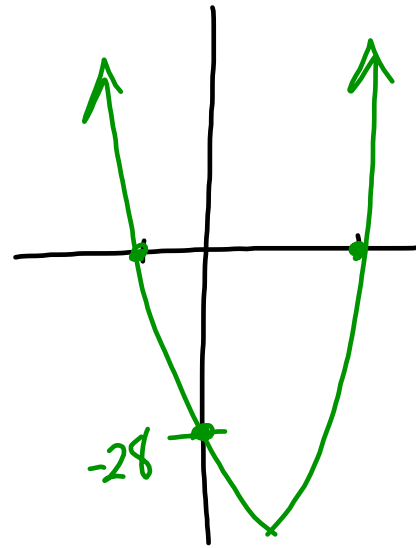
$(m-7)(m+4) = 0$

$m-7=0$ or $m+4=0$

$m=7$

$m=-4$

$\{7, -4\}$



2. $4p^2 - 12p = -9$

$4p^2 - 12p + 9 = 0$

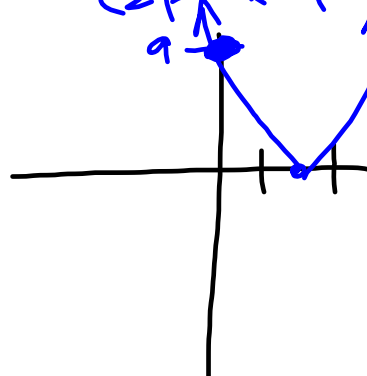
X	H
36	H2
$-6, -6$	

$(2p-3)^2 = 0$

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

$2p-3=0$ $\left\{ \frac{3}{2} \right\}$
 $2p=3$
 $p=\frac{3}{2}$

~~$4p^2 - 6p - 6p + 9 = 0$~~
 ~~$2p(2p-3) - 3(2p-3) = 0$~~
 ~~$(2p-3)(2p-3) = 0$~~



$$3. p^2 - 10 = -1$$

$$p^2 - 9 = 0$$

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

$$p-3=0 \text{ or } p+3=0$$

$$p=3$$

$$p=-3$$

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

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

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

$$x=0 \text{ or } x-5=0$$

$$x=5$$

$$\{5, 0\}$$

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10-16 evens, 36-44 evens

