Algebra 1 **9.2 Notes – Solving Quadratics by Factoring**

Ex. 1: Solve the quadratic. $(x-9)(5x+2)=0$

$x-9=0$ $\quad$ $5x+2=0$

$+9\ +9$ $\quad$ $-2\ -2$

$x=9$ $\quad$ $\frac{5x}{5}=\frac{-2}{5}$

$x=-2/5$

1) For $a\cdot b=0$, either a or b equals 0. So with that logic, either $(x-9)=0$ or $(5x+2)=0$
2) Determine what value of x makes the factor equal zero by setting the factor equal to zero.
3) Solve each factor for x.

Ex. 2: Solve the quadratic. $(2x-1)(x+3)=0$

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

$+1\ +1$ $\quad$ $-3\ -3$

$\frac{2x}{2}=\frac{1}{2}$

$x=1/2$ $\quad$ $x=-3$

Ex. 3: Solve the quadratic by factoring. $x^2+9x=-20$

$+20\ +20$

$x^2+9x+20=0$

$m\cdot n=20$	$m+n=9$
$2\cdot 10$	12
$1\cdot 20$	21
$4\cdot 5$	9

$(x+4)(x+9)=0$

$x+4=0$ $\quad$ $x+9=0$

$-4\ -4$ $\quad$ $-9\ -9$

$x=-4$ $\quad$ $x=-9$

1) Get everything on one side of the = sign.
2) Factor

Ex. 3: Solve the quadratic by factoring. $2x^2-x-3=0$

$m\cdot n=-6$	$m+n=-1$
$3\cdot -2=-6$	1
$-3\cdot 2=-6$	-1

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

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

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

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

$+3\ +3$ $\quad$ $-1\ -1$

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

$x=3/2$ & $x=-1$

You Try! Solve by factoring: $x^2 - x = 20$

$m \cdot n = -20$	$m + n = -1$
$-5 \cdot 4$	-1

$x^2 - 1x - 20 = 0$

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

$x - 5 = 0$ $\quad$ $x + 4 = 0$

$+5 \quad +5$ $\quad$ $-4 \quad -4$

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

Ex. 4: Use factoring to graph the function: $f(x) = x^2 - 2x - 8$

$m \cdot n = -8$	$m + n = -2$
$-4 \cdot 2$	-2

$f(x) = (x-4)(x+2)$

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

$x - 4 = 0$ $\quad$ $x + 2 = 0$

$x = 4$ $\quad$ $x = -2$

1) Factor and find the x-intercepts.

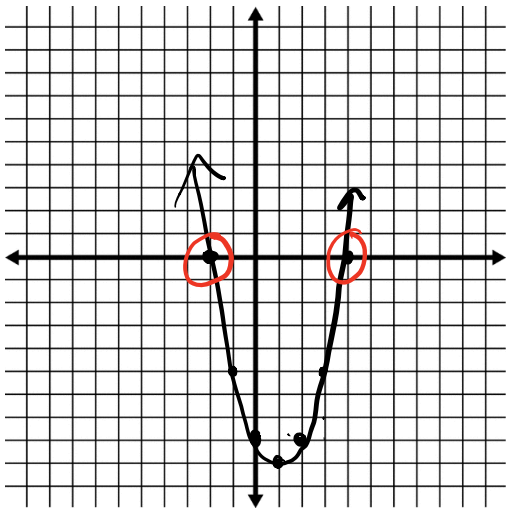
2) Plot the x-intercepts

3) Find the vertex and graph.

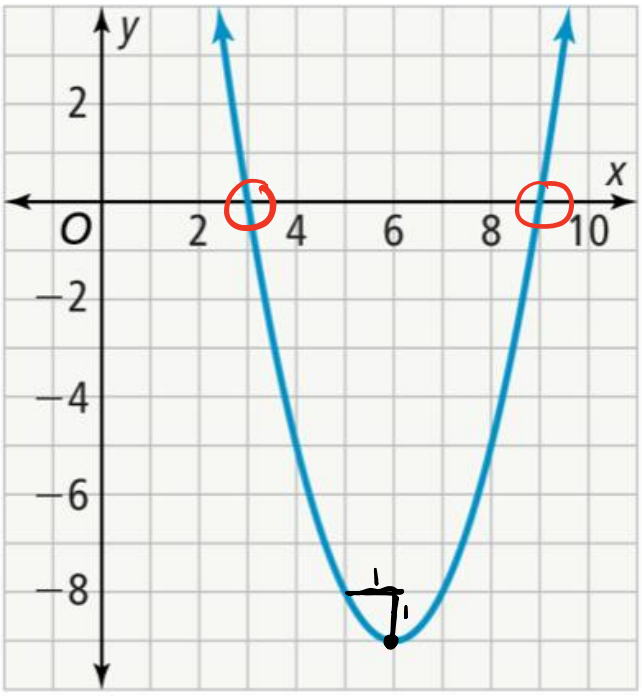
Vertex $x = \frac{-b}{2a} = \frac{-(-2)}{2(1)} = 1$

$f(x) = 1^2 - 2(1) - 8$

$f(x) = 1 - 2 - 8 = -9$



Ex. 5: Write the factored form of the quadratic given the graph.



Solutions: (3,0), (9,0)

$f(x) = (x-3)(x-9)$