

# Factoring to Solve Quadratic Equations (Section 3-5)

\* If you have  $x \cdot y = 0$ , then you know that  $x=0$ ,  $y=0$  or both equal zero.

The same is true when you factor a quadratic that is equal to zero.

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

$\downarrow$                        $\downarrow$   
 $x+1=0$        $x-5=0$

$x=-1$	$x=5$
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ex:  $(2y+1)(y+14)=0$

$\downarrow$                        $\downarrow$   
 $2y+1=0$        $y+14=0$

$2y=-1$ $y=-\frac{1}{2}$	$y=-14$
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ex:  $-3n(2n-5)=0$

$\downarrow$                        $\downarrow$   
 $-3n=0$        $2n-5=0$

$\frac{-3n}{-3} = \frac{0}{-3}$ $n=0$	$\frac{2n}{2} = \frac{5}{2}$ $n=5/2$
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ex:  $m^2-5m-14=0$

$(m-7)(m+2)=0$

$m=7$	$m=-2$
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ex:  $2a^2-15a+18=0$

$\uparrow$                        $\uparrow$   
 $36 < \frac{-12}{2}$   
 $\frac{-15}{2}$

$2a^2-12a-3a+18=0$

$(2a-3)(a-6)=0$

$a=3/2$	$a=6$
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ex:  $3h^2+17h=-10$

$3h^2+17h+10=0$

$\uparrow$                        $\uparrow$   
 $30 < \frac{15}{2}$   
 $\frac{17}{2}$

$3h^2+15h+2h+10=0$

$(3h+2)(h+5)=0$

$h=-2/3$	$h=-5$
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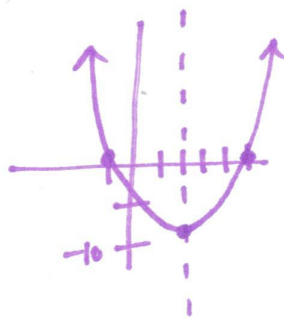
\* Zero can be used to graph the function.

ex:  $f(x) = x^2 - 4x - 5$  what are the zeros? Graph it.

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

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

$$\boxed{x=5} \quad \boxed{x=-1}$$



vertex:  $(2, -9)$

$$x = \frac{-b}{2a} \rightarrow \text{axis of symm}$$

$$= \frac{-(-4)}{2(1)} = 2 \quad f(2) = (2)^2 - 4(2) - 5 = -9$$