2Q6 - Teacher Notes

Notes (20 points) - 2Q6	/20

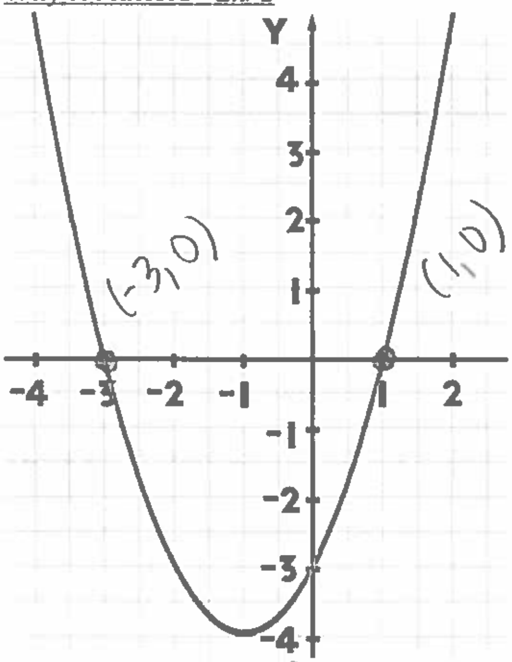
Solving Quadratic Equations

Zero-Product Property: For any real numbers a and b, if $a = 0$ OR if $b = 0$, then $ab = 0$.

Therefore, if $ab = 0$, then $a=0$ OR $b=0$.

Example: If $(x+3)(x+2) = 0$ then $x+3=0$ OR $x+2=0$.

Why It Matters - Ex. 1



$f(x) = x^2 + 2x - 3$

What are the x-intercepts of the quadratic function?

(1,0) + (-3,0)   * y=0 for x-ints

**If we set the function equal to 0, then we can solve for the x-intercepts.

Because of the Zero-Product Property, we should factor!

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

$x^2 + 3x - 1x - 3 = 0$ add to 2

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

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

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

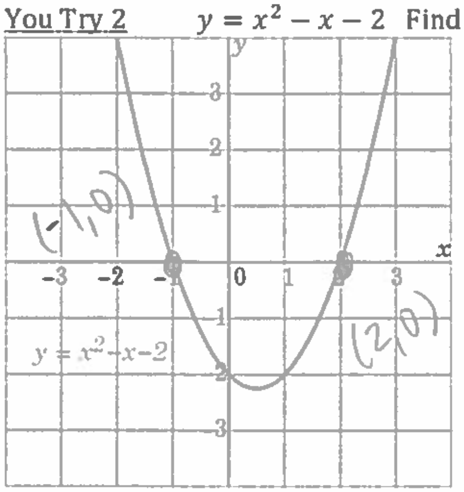
$-3 \quad -3$ $+1 \quad +1$

$x=-3$ $x=1$

x-ints: (-3,0) + (1,0)

$\boxed{\text{roots: } \{-3, 1\}}$

You Try 2 $y = x^2 - x - 2$ Find the x-intercepts of the function algebraically. Confirm with the graph.



$x^2 - x - 2 = 0$

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

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

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

$x+1=0$ $x-2=0$

$-1 \quad -1$ $+2 \quad +2$

$x=-1$ $x=2$

Steps

1) Set the function = 0.
2) Factor the function.
3) Set each factor = 0.
4) Solve each equation.
5) Write your x-intercepts as ordered pairs.
6) Write your roots/zeros as a solution set.

x-ints: (-1,0) + (2,0)

$\boxed{\text{roots: } \{-1, 2\}}$

↳ aka zeros, solutions

$\frac{-2}{-2 \cdot 1}$ $-2+1=-1$