C11 - 9.2 - Linear/Quadratic Inequalities In One Variable Notes

Solve

$x - 2 \leq 0$

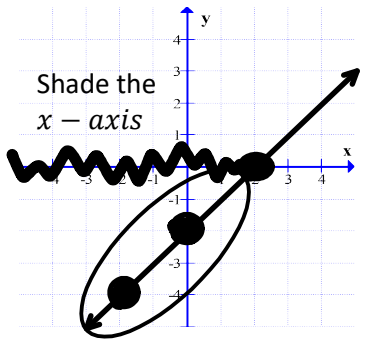
$x - 2 \leq 0$

$+2 \quad +2$ Solve

$x \leq 2$

Graphing

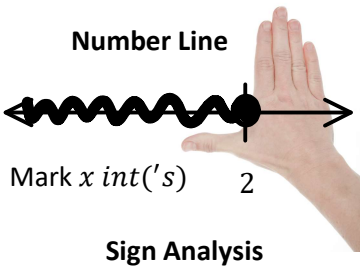
$y\ values \leq 0$
$The\ Thing \leq 0$



$y = x - 2$

What are the x values when $y \leq 0$. Circle them!

Number Line



Sign Analysis

Pick a value

$x \leq 2$ $\quad$ $x \geq 2$

$x = 0$ Substitute $x = 4$

$x - 2 \leq 0$
$0 - 2 \leq 0$
$-2 \leq 0$ ✓

$x - 2 \leq 0$
$4 - 2 \leq 0$
$2 \leq 0$ ✗

Correct: Shade that section

Incorrect: Shade Not that section

$x \leq 2$

$-x^2 + 5x - 4 < 0$

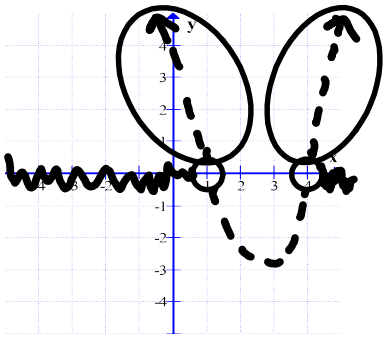
$-x^2 + 5x - 4 < 0$
$-(x^2 - 5x + 4) < 0$
$\frac{-(x^2 - 5x + 4)}{-1} > \frac{0}{-1}$ $\div -1^*$
$x^2 - 5x + 4 > 0$
$(x - 4)(x - 1) > 0$ Factor

$x - intercept's$

$x - 4 = 0$ $\quad$ $x - 1 = 0$
$x = 4$ $\quad$ $x = 1$

Graphing

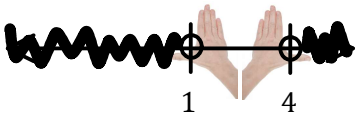
$y\ values > 0$
$The\ Thing > 0$



$y = (x - 4)(x - 1)$

What are the x values when $y > 0$. Circle them!

Number Line



Sign Analysis

Pick a value

$x < 1$ $\quad$ $1 < x < 4$ $\quad$ $x > 4$

$x = 0$ $\quad$ $x = 2$ $\quad$ $x = 5$

Substitute

$(x - 4)(x - 1) > 0$
$(0 - 4)(0 - 1) > 0$
$(-4)(-1) > 0$
$4 > 0$ ✓

$(1)(4) > 0$
$4 > 0$ ✓

$(-2)(1) > 0$
$-2 > 0$ ✗

$x < 1 \quad x > 4$

$x^2 - 4 \leq 0$

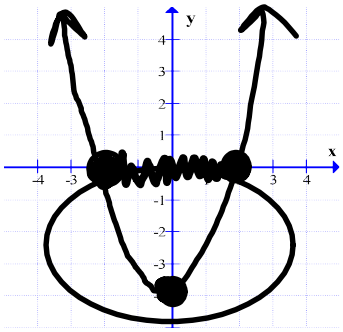
$x^2 - 4 \leq 0$
$(x + 2)(x - 2) \leq 0$

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

$x - intercept's$

Graphing

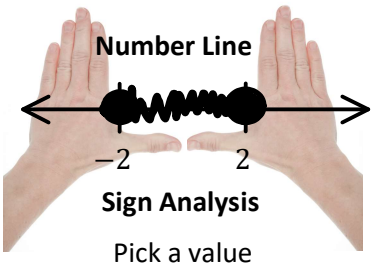
$y\ values \leq 0$
$The\ Thing \leq 0$



$y = x^2 - 4$

What are the x values when $y \geq 0$. Circle them!

Number Line



Sign Analysis

Pick a value

$x \leq -2$ $\quad$ $-2 \leq x \leq 2$ $\quad$ $x \geq 2$

$x = -3$ $\quad$ $x = 0$ $\quad$ $x = 3$

$x^2 - 4 \leq 0$
$(-3)^2 - 4 \leq 0$
$5 \leq 0$ ✗

$x^2 - 4 \leq 0$
$(0)^2 - 4 \leq 0$
$5 \leq 0$ ✓

$x^2 - 4 \leq 0$
$(3)^2 - 4 \leq 0$
$5 \leq 0$ ✗

$-2 \leq x \leq 2$

The answer is only the Domain. The number line and graph is only to help. There is no y involved.