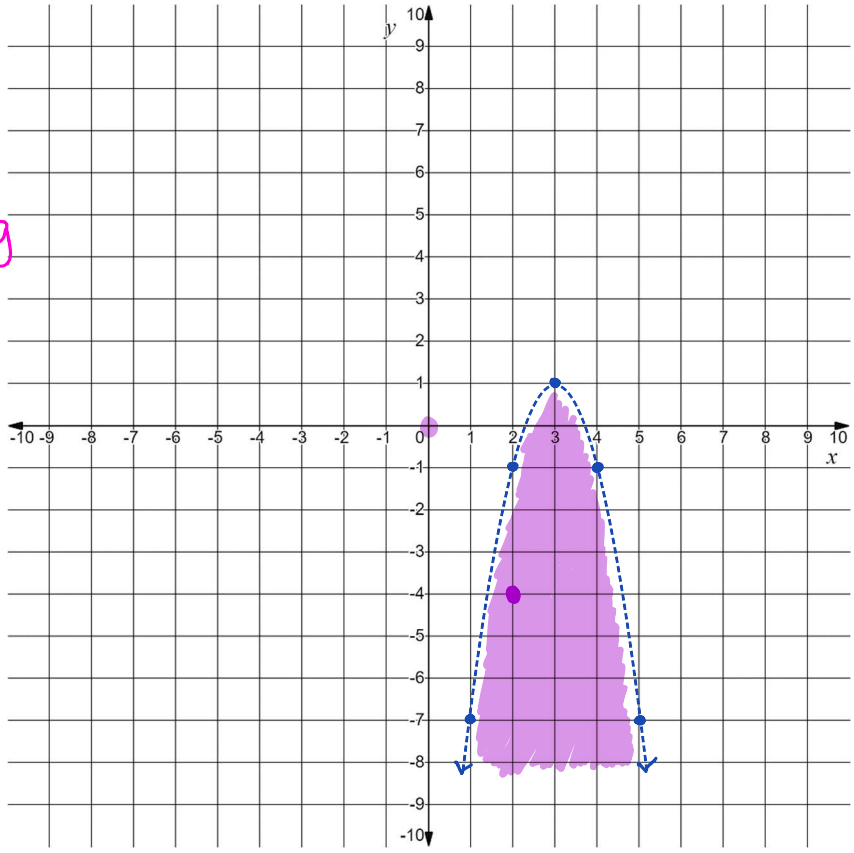
Name: _____ Date: _____

Learning Goal 9.2	Solving quadratic inequalities.

Example Graph $y < -2(x-3)^2 + 1$ and determine whether the point $(2, -4)$ is a solution to the inequality.



Recall vertex form:

$y = a(x-p)^2 + q$

- smiling/frowning
- expansion/compression
- vertex @ (p, q)

- so our vertex is at $(3, 1)$
- it is frowning with a vertical compression/horizontal expansion of 2.

either a table of values or a 'pseudo' table of values:

x	y
1	-7
2	-1
3	1
4	-1
5	-7

vertex in the middle → 3

mirror

with an exp/comp of 2:

left/right	down
1	$2 \times (1)^2 = 2$
2	$2 \times (2)^2 = 8$
3	$2 \times (3)^2 = 18$

Now for the inequality:

TP: (0,0)

$y < -2(x-3)^2 + 1$

$0 < -2(0-3)^2 + 1$

$0 < -2(-3)^2 + 1$

$0 < -2(9) + 1$

or

(2,-4) $y < -2(x-3)^2 + 1$

$-4 < -2(2-3)^2 + 1$

$-4 < -2(-1)^2 + 1$

$-4 < -2 + 1$

$-4 < -1$ ✓

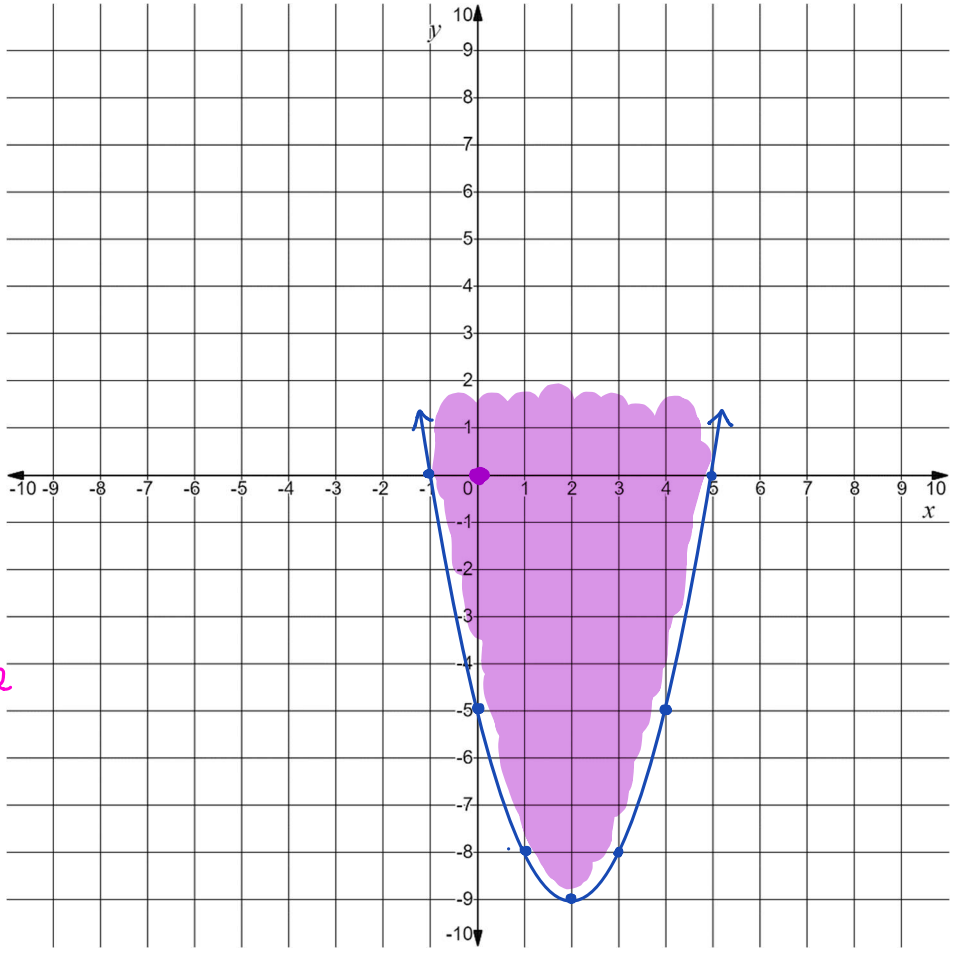
so (2,-4) is a solution to the inequality

Assignment p. 496 # 1 – 8 Quiz Next Day!

$0 < -18 + 1$

$0 < -17$ ✗

Example Graph $y \geq x^2 - 4x - 5$.



Standard form is not great to graph from.

so

complete the square!

$y \geq (x^2 - 4x) - 5$

$(-\frac{4}{2})^2 = (-2)^2 = 4$

$y \geq (x^2 - 4x + 4 - 4) - 5$

$y \geq (x^2 - 4x + 4) - 4 - 5$

factor Combine

$y \geq (x-2)^2 - 9$

vertex $(2, -9)$

- smiling
- no exp/comp factor

TP: $(0,0)$ $y \geq x^2 - 4x - 5$.

$0 \geq (0)^2 - 4(0) - 5$

$0 \geq 0 - 0 - 5$

$0 \geq -5$ ✓