Which Side to Shade

Solve for y (flip the sign if you multiply or divide by a negative), graph the boundary from m and b, dashed or solid, shade above for y greater and below for y less, and confirm with a test point.

Name _____ Date _____

Words we use

say the math word, then the plain English

WORD	PLAIN ENGLISH	WHAT YOU DO
Shade	Color the half-plane of solutions.	Above for y greater, below for y less, once y is alone.
Test point	An easy point not on the line, usually (0, 0), that you put into the original inequality to confirm the side.	True: shade its side. False: shade the other side.
Above and below the line	Higher points and lower points at the same x.	y greater than the line is above; y less than is below.
Flip the sign	When you multiply or divide both sides by a negative number, turn the inequality sign around (Unit 1, Lesson 6).	Do it while solving for y, before you read the side.
Vertical boundary	x = a number: straight up and down, no slope.	x greater: right. x less: left.
Horizontal boundary	y = a number: flat, slope 0.	y greater: above. y less: below.

Part A Solve for y, and watch the sign

Get y alone. Write where the sign flipped, if it did.

INEQUALITY	SOLVED FOR Y	FLIP? WHERE?
$2x + y < 5$		
$-y \geq x - 4$		
$3x - 2y > 8$		
$-3y \leq 6x + 9$		

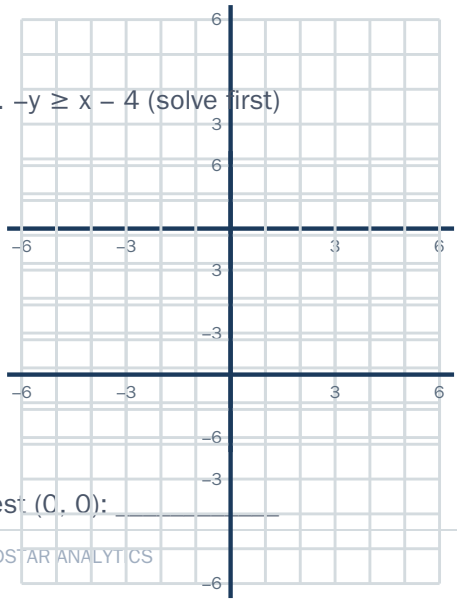
Part B Graph it

Boundary from m and b, dashed or solid, shade the side. Mark your test point and write the check.

1. $y > 3x - 2$

2. $y \leq -x + 4$

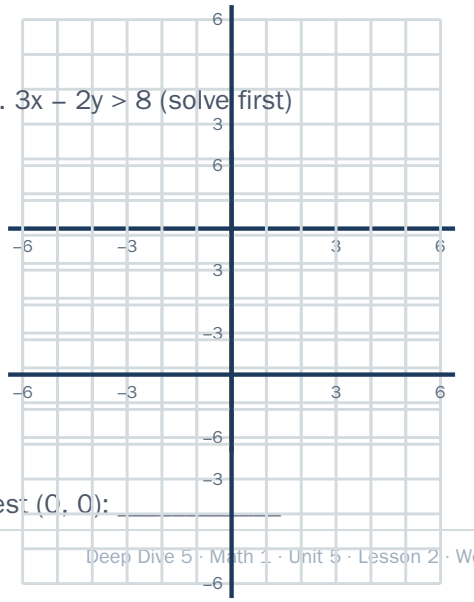
3. $-y \geq x - 4$ (solve first)



test (0, 0): _____

solved: _____ test: _____

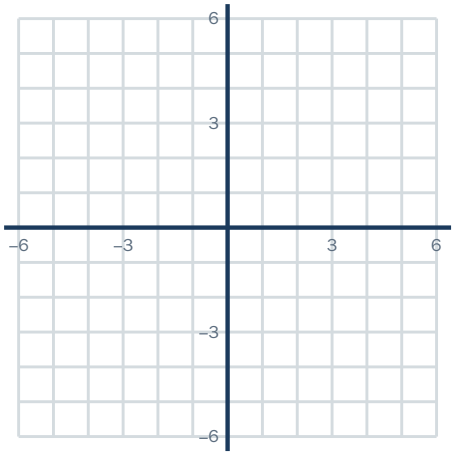
4. $3x - 2y > 8$ (solve first)



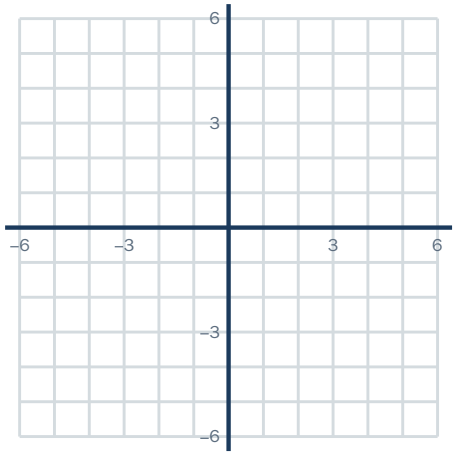
test (0, 0): _____

solved: _____ test: _____

5. $x \leq -1$



6. $y > 4$



Part C In your own words

1. Why is y > (a line) shaded above? Say it with the words same x and bigger y.

2. What is the test point for, and why must you put it into the original inequality?

3. How do you shade x > 3, and why is there no m and b to read?

Part D Exit ticket

1. The five steps, in order:

2. y < 2x – 3 in words: boundary, style, side, test point.

Answer key

Part A. $y < -2x + 5$, no flip. $y \leq -x + 4$, flipped when multiplying by -1. $y < 3/2\ x - 4$, flipped when multiplying by $-1/2$. $y \geq -2x - 3$, flipped when multiplying by $-1/3$.

Part B. 1. Dashed through (0, –2) slope 3, above; $0 > -2$ true, (0, 0)'s side. 2. Solid through (0, 4) slope –1, below; $0 \leq 4$ true. 3. $y \leq -x + 4$: solid, below; $0 \geq -4$ true in the original. 4. $y < 3/2\ x - 4$: dashed, below; $0 > 8$ false, away from (0, 0). 5. Vertical solid at $x = -1$, left. 6. Horizontal dashed at $y = 4$, above.

Part C. 1. At the same x, a solution has a bigger y, which is a higher point. 2. To confirm the side; the original has no solving mistakes in it. 3. Vertical dashed line at $x = 3$, shade right; $x = 3$ is not a function of x, no m and b.

Part D. 1. Solve for y (flip on a negative), boundary from m and b, dashed or solid, shade above or below, test point. 2. $y = 2x - 3$, dashed, below; $0 < -3$ false, so away from (0, 0): below.