Match It and Write It

Three clues: the boundary (m and b), the line style (dashed is strict, solid is inclusive), and the shaded side (above is greater, below is less). Read them to write the inequality; run them in order to eliminate graphs.

Name _____ Date _____

Words we use

say the math word, then the plain English

WORD	PLAIN ENGLISH	WHAT YOU DO
Strict inequality	< or >. The edge is not included, so the boundary is dashed.	Dashed line means strict sign, and the other way around.
Inclusive inequality	≤ or ≥. The edge is included, so the boundary is solid.	Solid line means inclusive sign.
Boundary	The edge line, y = mx + b, read from the graph as in Unit 3.	Clue 1 when reading or eliminating.
Shaded side	Above the line means y greater; below means y less.	Clue 3.
Match by elimination	Read what the inequality forces, cross out every graph that breaks a clue, check the one left.	Boundary, then style, then side. Do not plug in points to find it.
Half-plane	One whole side of the boundary: the region of solutions.	What the shading shows.

Part A Write it from the clues

Each region is described. Write the inequality.

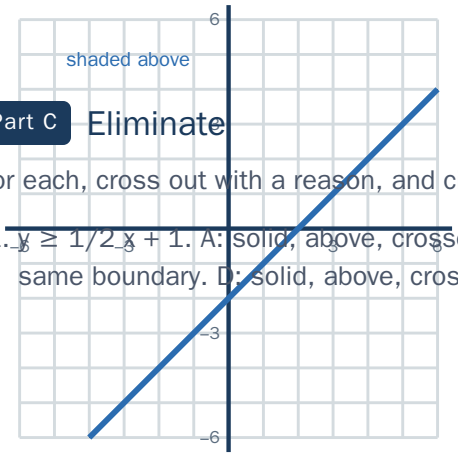
BOUNDARY	STYLE	SHADED	INEQUALITY
crosses at 4, falls 3 per 1	dashed	above	
crosses at –2, rises 1 per 4	solid	below	
crosses at 0, rises 2 per 1	dashed	below	
horizontal at y = 3	solid	above	
vertical at x = –1	dashed	left	

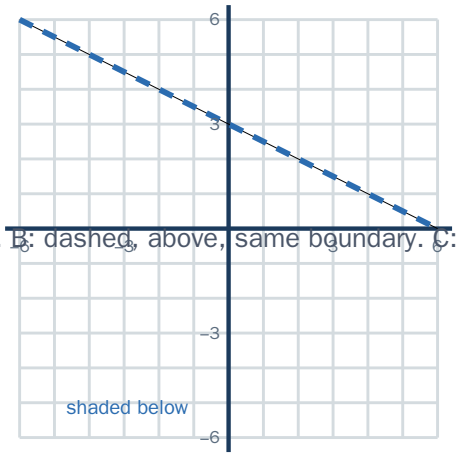
Part B Read the drawn regions

Each grid shows a boundary (dashed or solid) with the shaded side marked by the arrow word. Write the inequality.

1. Solid line, shaded above.

2. Dashed line, shaded below.





Part C Eliminate

For each, cross out with a reason, and circle the one left.

1. $y \geq 1/2\,x + 1$. A: solid, above, crosses at 1, rises 1 per 2. B: dashed, above, same boundary. C: solid, below, same boundary. D: solid, above, crosses at –1.

2. $y < -2x + 5$. A: dashed, below, crosses at 5, falls 2 per 1. B: dashed, below, crosses at 5, falls 1 per 2. C: solid, below, same as A. D: dashed, above, same as A.

3. $x > -3$. A: vertical dashed at –3, right. B: vertical dashed at –3, left. C: vertical solid at –3, right. D: horizontal dashed at –3, above.

Part D In your own words

1. What are the three clues, and what does each one tell you?

2. Why do we go boundary first when eliminating?

3. When is it fine to plug in a point?

Part E Exit ticket

1. Crosses at –2, rises 3 per 1, solid, shaded above:

2. $y < x + 2$ against a solid-below graph and a dashed-below graph with the right boundary: which, and why?

Answer key

Part A. $y > -3x + 4$; $y \leq 1/4\ x - 2$; $y < 2x$; $y \geq 3$; $x < -1$.

Part B. 1. $y \geq x - 2$. 2. $y < -1/2\ x + 3$.

Part C. 1. A (D wrong boundary, B dashed but inclusive, C below but greater). 2. A (B too gentle, C solid but strict, D above but less). 3. A (D horizontal, B left but x greater, C solid but strict).

Part D. 1. Boundary: m and b. Style: strict or inclusive. Side: greater or less. 2. A wrong boundary rules a graph out no matter how it is shaded. 3. Only to double-check after the clues decided.

Part E. 1. $y \geq 3x - 2$. 2. The dashed one: strict sign.