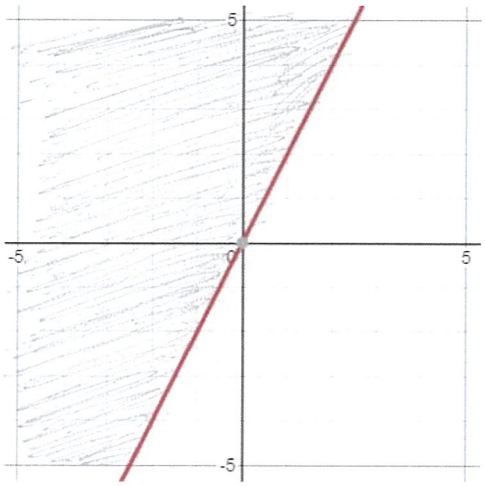
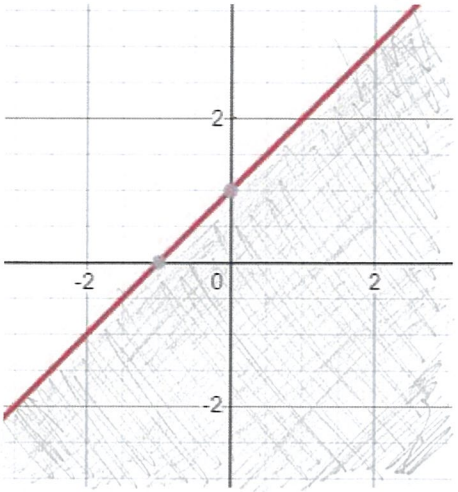
REGIONS AND INEQUALITIES

Shade the region represented by each inequality.

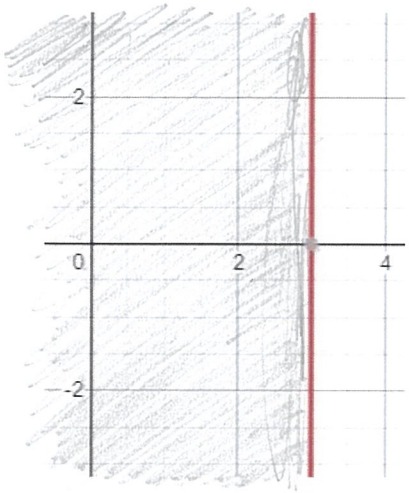
1 $y > 2x$



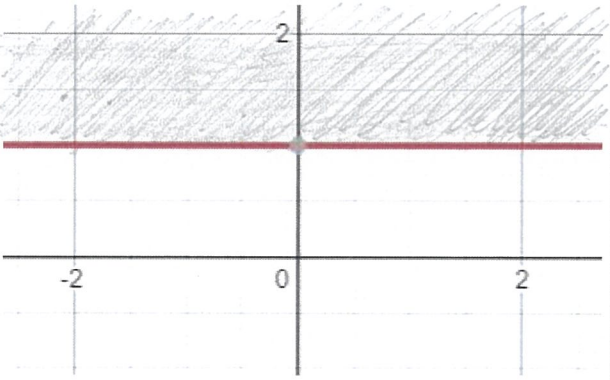
2 $y < x + 1$



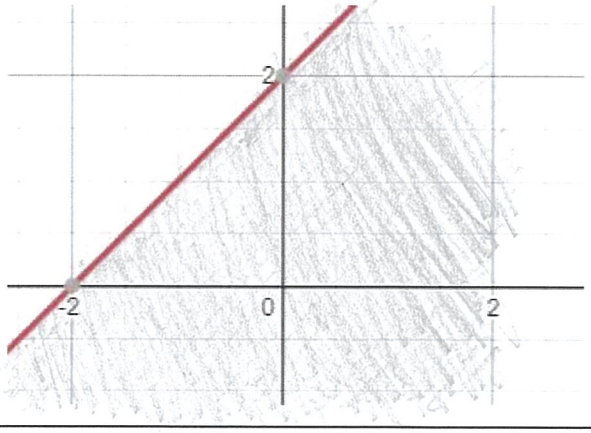
3 $x \leq 3$



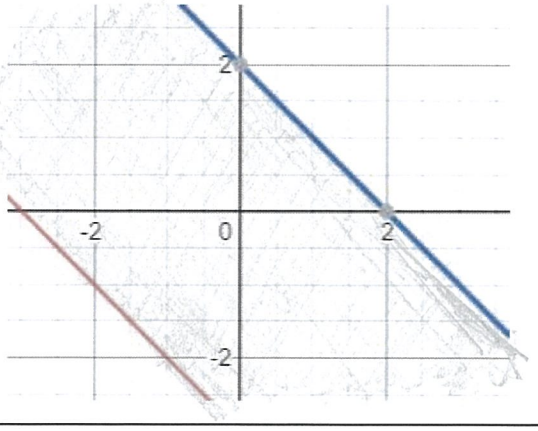
4 $y \geq 1$



5 $y \leq x + 2$

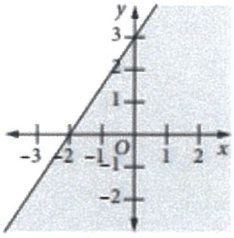


15 $-3 < x + y < 2$



REGIONS AND INEQUALITIES

17 Which inequality defines the shaded region?



A $3x - 2y + 6 \geq 0$ YES

B $3x - 2y + 6 \leq 0$ NO

C $3x + 2y - 6 \geq 0$ NO

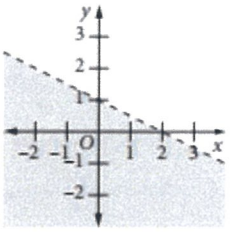
D $3x + 2y - 6 \leq 0$ NO

line is $y = \frac{3}{2}x + 3$

or $2y - 3x - 6 = 0$

or $3x - 2y + 6 = 0$

20 For this graph, indicate whether each statement is correct or incorrect.



(a) The equation of the boundary is $x + 2y - 2 = 0$. YES

(b) The gradient of the boundary line is $\frac{1}{2}$. NO, it's $-1/2$

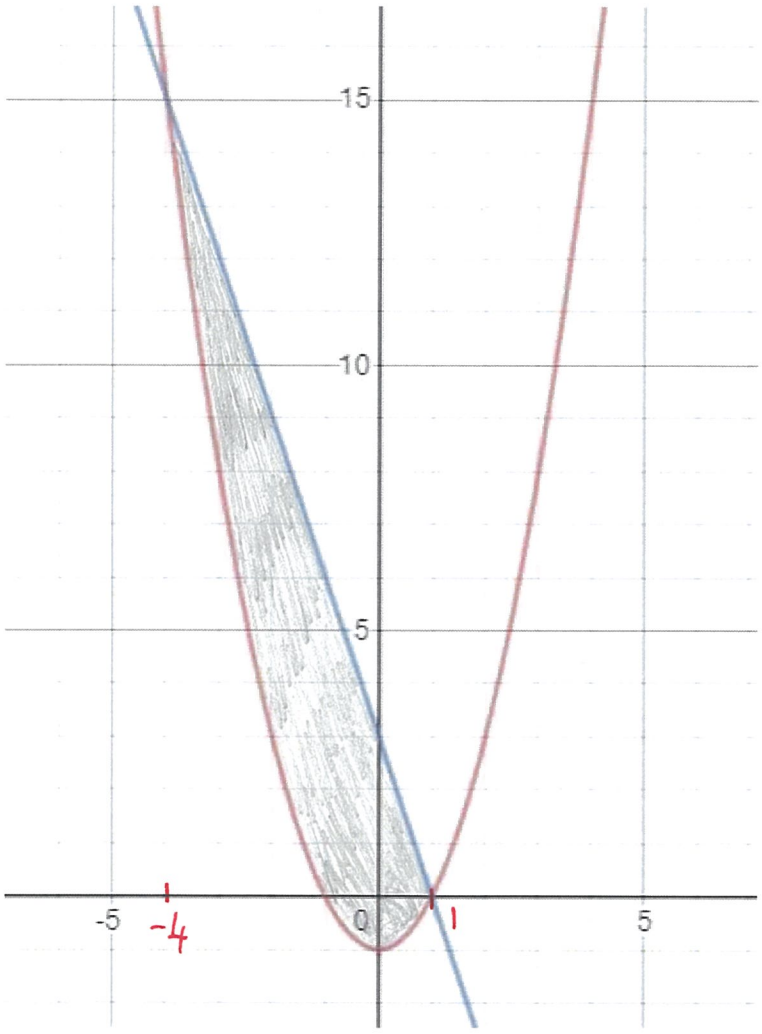
(c) The inequality for the region is $x + 2y - 2 > 0$. NO

(d) The inequality for the region is $x + 2y - 2 < 0$. YES

line is $y = -\frac{1}{2}x + 1$ $\Leftrightarrow 2y + x - 2 = 0$

21 **(a)** Sketch the region defined by the intersection $y \geq x^2 - 1$ and $y \leq 3 - 3x$.

(b) Hence write the solution to $x^2 + 3x - 4 \leq 0$.



$x^2 + 3x - 4 \leq 0$

$\Leftrightarrow x^2 - 1 + 3x - 3 \leq 0$

$\Leftrightarrow x^2 - 1 \leq 3 - 3x$

The two curves intersect when $x^2 + 3x - 4 = 0$

i.e when $x = 1$ or $x = -4$

So the solutions are

$-4 \leq x \leq 1$