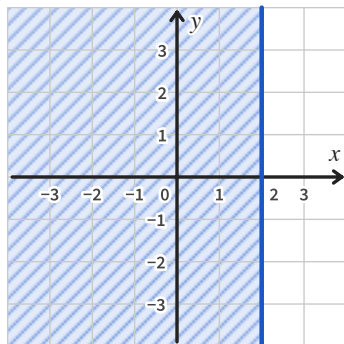


Inequalities and regions

ANSWERS

1

Show $x \leq 2$ on the grid.



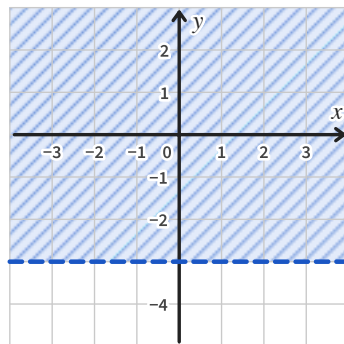
1 Dashed or solid? **Solid**

3 Test a point: **(0, 0): $0 \leq 2$. True.**

4 Side: *the side with (0, 0): the left*

2

Show $y > -3$ on the grid.



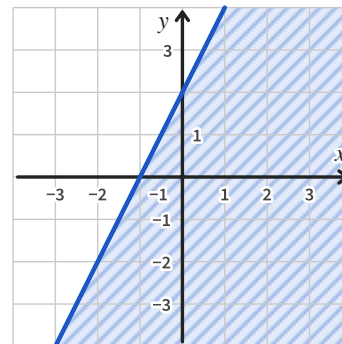
1 Dashed or solid? **Dashed**

3 Test a point: *(0, 0): $0 > -3$. True.*

4 Side: *the side with (0, 0): above*

3

Show $y \leq 2x + 2$ on the grid.



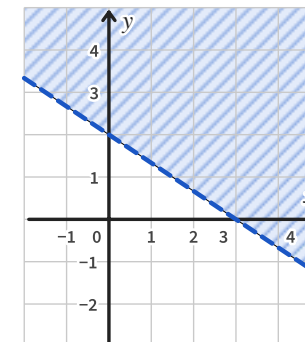
1 Dashed or solid? *Solid*

3 Test a point: *(0, 0): $0 \leq 2$. True.*

4 Side: *the side with (0, 0): below*

4

Show $2x + 3y > 6$ on the grid.

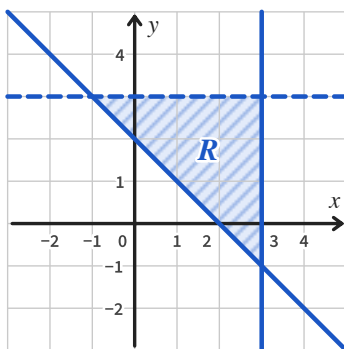


dashed; (0, 0): $0 > 6$. False.

the other side: above

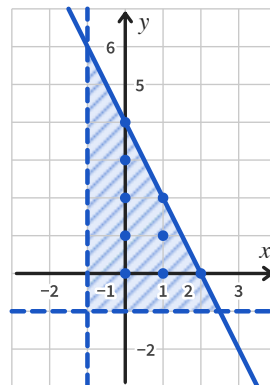
5

Shade the region R where $x + y \geq 2$, $y < 3$ and $x \leq 3$.



6

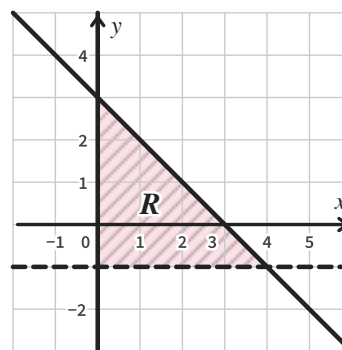
R is the region where $x > -1$, $y > -1$ and $2x + y \leq 4$. How many points with integer coordinates are in R?



Answer 9

7

Write down the three inequalities that describe R.



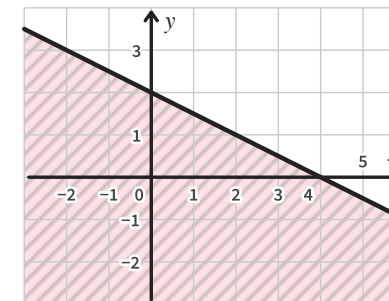
$x = 0$: *$x \geq 0$*

$y = -1$: *$y > -1$*

$x + y = 3$: *$x + y \leq 3$*

8

Kai shows $x + 2y > 4$ with a solid line and shades the side with (0, 0). Explain his two mistakes.



1: *the line should be dashed for >*

2: *(0, 0): $0 > 4$ is false: the other side*

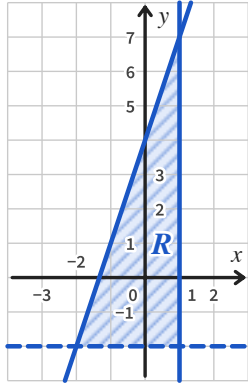
Inequalities and regions *further practice*

ANSWERS

9



Shade the region R where $y > -2$, $x \leq 1$ and $y \leq 3x + 4$.



R on the grid

Answer

10



Is the point $(2, -1)$ in the region where $y > x - 4$ and $2x + y \leq 3$? Show how you know.

$$-1 > 2 - 4 = -2. \text{ True.}$$

$$2 \times 2 + (-1) = 3 \leq 3. \text{ True: on the solid line.}$$

Yes

Answer

11



A garden centre packs x large pots and y small pots in a box, where $x \geq 1$, $y \geq 2$ and $3x + y \leq 9$. x and y are integers. How many different boxes can it pack?

$$(1, 2), (1, 3), (1, 4), (1, 5), (1, 6),$$

$$(2, 2), (2, 3)$$

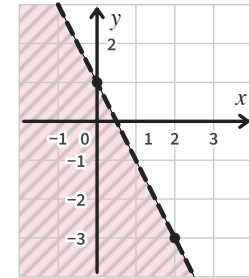
7

Answer

12



The dashed line goes through $(0, 1)$ and $(2, -3)$. The region below it is shaded. Write down the inequality.



$$\text{gradient } -4 \div 2 = -2; \text{ dashed, below}$$

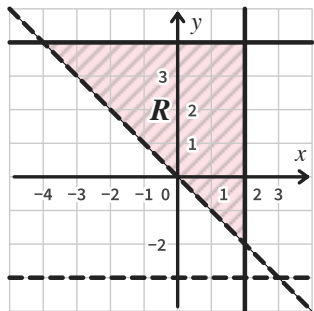
$$y < -2x + 1$$

Answer

13



Write down the three inequalities that describe R.



$$y = -3 \text{ is not an edge of } R$$

$$y \leq 4, y > -x, x \leq 2$$

Answer

14



R is the region where $y \geq -2$, $y < x$ and $x + y < 3$. Which of these points are in R: $(0, -1)$, $(2, 0)$, $(3, 0)$, $(1, 1)$?

$$(3, 0): 3 + 0 = 3, \text{ on the dashed line}$$

$$(1, 1): \text{ on the dashed line } y = x$$

$$(0, -1) \text{ and } (2, 0)$$

Answer

15



R is the triangle with corners $(0, 0)$, $(4, 0)$ and $(0, 4)$. Its edges on the axes are solid and its third edge is dashed. Write down the three inequalities.

$$\text{the third edge is } x + y = 4$$

$$(1, 1) \text{ is in } R: 2 < 4$$

$$x \geq 0, y \geq 0, x + y < 4$$

Answer

16



Lena says the point $(3, 2)$ is in the region $y \geq 2x - 4$ because it is above the line. Is she right? Explain.

$$2 \times 3 - 4 = 2, \text{ so } (3, 2) \text{ is on the line}$$

$$\text{the line is solid } (\geq), \text{ so it is in } R$$

$$\text{In } R, \text{ but on the line}$$

Answer