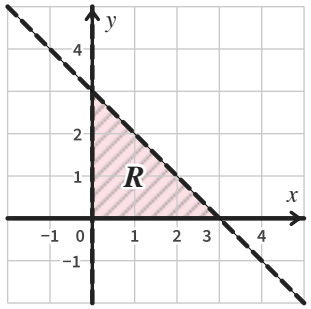
Inequalities and regions: describing a region

ANSWERS

1

List the points with integer coordinates in R.

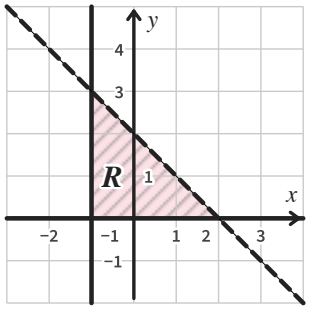


(1, 1)

(1, 0), (2, 0)

2

List the points with integer coordinates in R.

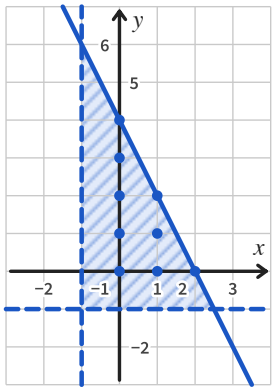


(−1, 0), (−1, 1), (−1, 2)

(0, 0), (0, 1), (1, 0)

3

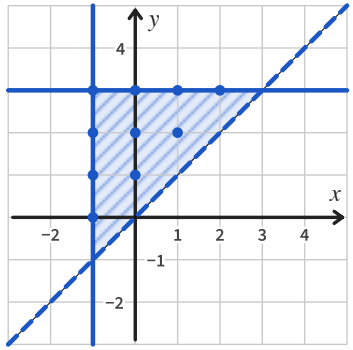
R is the region where $x > -1$, $y > -1$ and $2x + y \leq 4$. How many points with integer coordinates are in R?



Answer 9

4

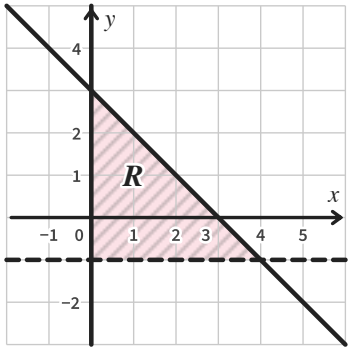
R is the region where $y > x$, $y \leq 3$ and $x \geq -1$. How many points with integer coordinates are in R?



Answer 10

5

Write down the three inequalities that describe R.



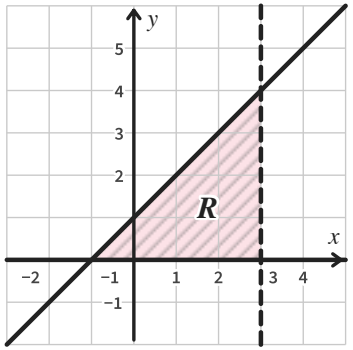
$x = 0$: $x \geq 0$

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

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

6

Write down the three inequalities that describe R.



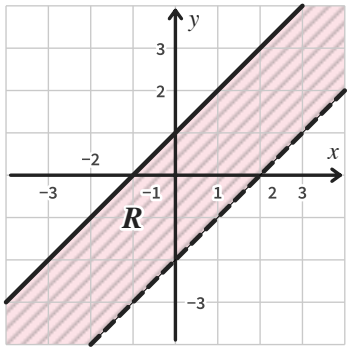
$y \geq 0$

$x < 3$

$y \leq x + 1$

7

Write down the two inequalities that describe R.

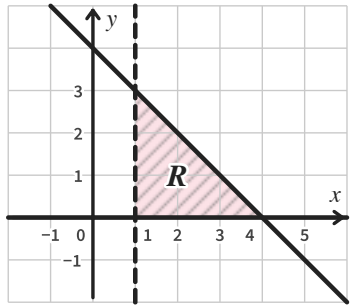


$y > x - 2$

$y \leq x + 1$

8

Mo says R is the region where $x < 1$, $y \geq 0$ and $x + y \leq 4$. Explain his mistake.



R is to the right of $x = 1$

(2, 1) is in R: $2 > 1$, so $x > 1$

Inequalities and regions: describing a region *further practice*

ANSWERS

9

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)

Answer 7

10

List the points with integer coordinates in the region where $x > -2$, $y > x$ and $y < 2$.

$x = -1$: $y = 0, 1$

$x = 0$: $y = 1$; $x = 1$: none

Answer (−1, 0), (−1, 1), (0, 1)

11

Priya lists the points with integer coordinates in the region where $x > 0$, $y > 0$ and $x + y \leq 4$: (1, 1), (1, 2), (2, 1), (2, 2), (0, 2). Which point is wrong, and which has she missed?

(0, 2): on the dashed line $x = 0$

(1, 3), (3, 1): on the solid line

Answer not (0, 2); add (1, 3), (3, 1)

12

R is the region where $x > 2$, $y > 0$ and $x + y < k$, where k is an integer. The only point with integer coordinates in R is (3, 1). Find k.

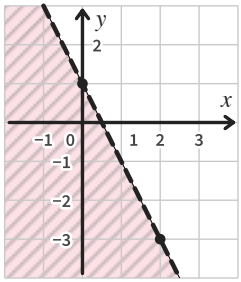
(3, 1) is in R: $4 < k$

(4, 1) is not: $5 < k$ is false

Answer 5

13

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

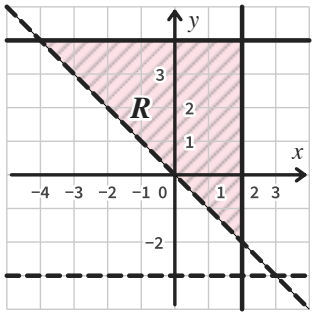


gradient $-4 \div 2 = -2$; dashed, below

Answer $y < -2x + 1$

14

Write down the three inequalities that describe R.



$y = -3$ is not an edge of R

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

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.

the third edge is $x + y = 4$

(1, 1) is in R: $2 < 4$

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

16

Ben says the region below the dashed line $y = 2x - 1$ is $y > 2x - 1$. Explain his mistake and write the right inequality.

(0, −3) is below the line

$-3 > -1$ is false, so it is not >

Answer $y < 2x - 1$