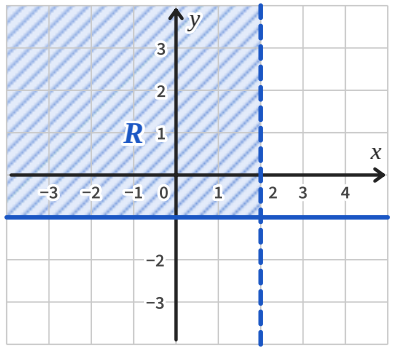
Inequalities and regions: shading a region

ANSWERS

1

Shade the region R where $x < 2$ and $y \geq -1$.



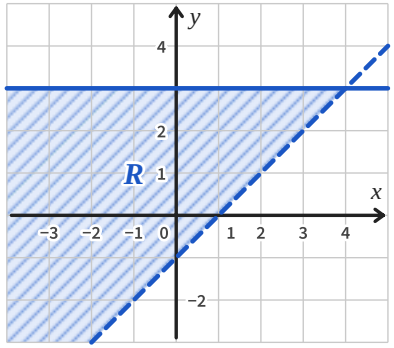
$x = 2$ dashed, $y = -1$ solid

$0 < 2$ true, $0 \geq -1$ true

left of $x = 2$, above $y = -1$

2

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



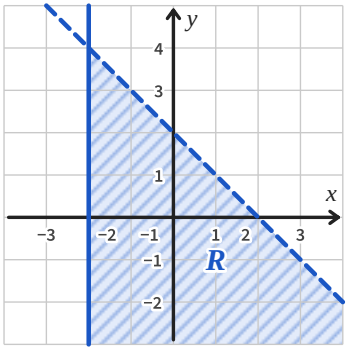
$y = 3$ solid, $y = x - 1$ dashed

$0 \leq 3$ true, $0 > -1$ true

below $y = 3$, above $y = x - 1$

3

Shade the region R where $x \geq -2$ and $x + y < 2$.

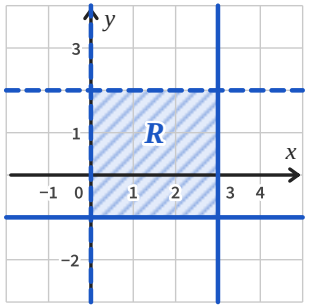


$x = -2$ solid, $x + y = 2$ dashed

$0 \geq -2$ true, $0 < 2$ true

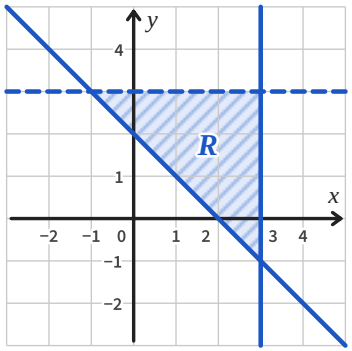
4

Shade the region R where $x > 0$, $x \leq 3$, $y \geq -1$ and $y < 2$.



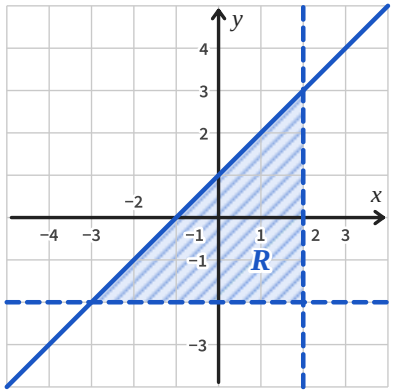
5

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



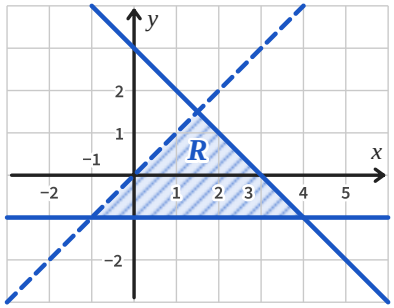
6

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



7

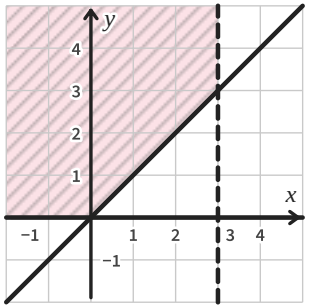
Shade the region R where $y \geq -1$, $y < x$ and $x + y \leq 3$.



(1, 0): $0 < 1$. True.

8

Zara shades R where $y \geq 0$, $x < 3$ and $y \leq x$. Which inequality has she shaded the wrong side of? Explain.



$y \leq x$: R is below $y = x$

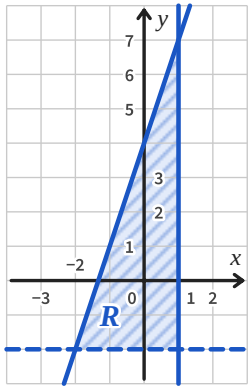
(2, 1): $1 \leq 2$. True.

Inequalities and regions: shading a region *further practice*

ANSWERS

9

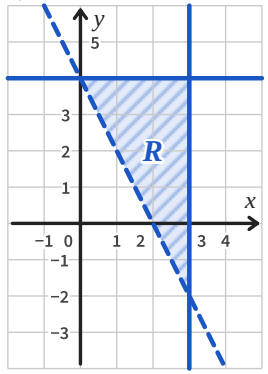
Shade the region R where $y > -2$, $x \leq 1$ and $y \leq 3x + 4$.



Answer *R on the grid*

10

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

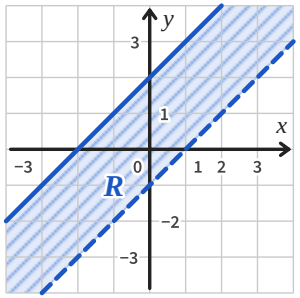


(0, 0): 0 > 4. False: the other side

Answer *R on the grid*

11

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



below y = x + 2, above y = x − 1

Answer *the strip between the lines*

12

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. True.

2 × 2 + (−1) = 3 ≤ 3. True: on the solid line.

Answer *Yes*

13

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, on the dashed line

(1, 1): on the dashed line y = x

Answer *(0, −1) and (2, 0)*

14

Is the point (−1, 3) in the region where $y \geq -2x + 1$ and $y < x + 5$?
Show how you know.

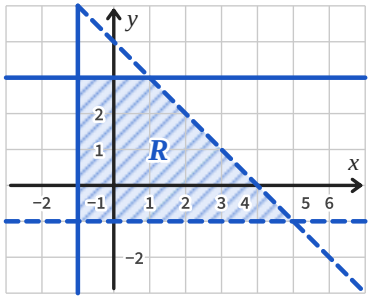
−2 × (−1) + 1 = 3; 3 ≥ 3. True: on the solid line.

−1 + 5 = 4; 3 < 4. True.

Answer *Yes*

15

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



corners (−1, −1), (5, −1), (1, 3), (−1, 3)

Answer *four corners*

16

Explain why there is no point in the region where $y > x + 2$ and $y < x - 1$.

the lines are parallel: both have gradient 1

y cannot be above x + 2 and below x − 1

Answer *No point is in both*