Solving Inequalities: Negatives and Brackets

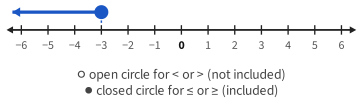
ANSWERS

1

Solve $9 - 4x \geq 21$ and show the answer on the number line.

$-4x \geq 12$

Answer $x \leq -3$



○ open circle for < or > (not included)
● closed circle for ≤ or ≥ (included)

Check: try a value from your answer in the question. Is it true?

$x =$ -4 $9 - 4 \times (-4) = 25$, and $25 \geq 21$ is true

2

Solve $15 - 2x < 7$ and show the answer on the number line.

$-2x < -8$

Answer $x > 4$



Check: try a value from your answer in the question. Is it true?

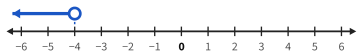
$x =$ 5 $15 - 2 \times 5 = 5$, and $5 < 7$ is true

3

Solve $-3x + 4 > 16$ and show the answer on the number line.

$-3x > 12$

Answer $x < -4$



Check: try a value from your answer in the question. Is it true?

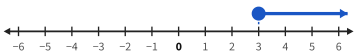
$x =$ -5 $-3 \times (-5) + 4 = 19$, and $19 > 16$ is true

4

Solve $6 - 5x \leq -9$ and show the answer on the number line.

$-5x \leq -15$

Answer $x \geq 3$



Check: try a value from your answer in the question. Is it true?

$x =$ 4 $6 - 5 \times 4 = -14$, and $-14 \leq -9$ is true

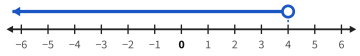
5

Solve $4(x - 1) < 12$ and show the answer on the number line.

$4x - 4 < 12$

$4x < 16$

Answer $x < 4$



Check: try a value from your answer in the question. Is it true?

$x =$ 0 $4 \times (0 - 1) = -4$, and $-4 < 12$ is true

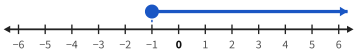
6

Solve $2(3x + 5) \geq 4$ and show the answer on the number line.

$6x + 10 \geq 4$

$6x \geq -6$

Answer $x \geq -1$



Check: try a value from your answer in the question. Is it true?

$x =$ 0 $2 \times (3 \times 0 + 5) = 10$, and $10 \geq 4$ is true

7

n is a positive integer and $11 - 3n > 2$. Write down all the possible values of n.

$-3n > -9$, so $n < 3$

Answer 1, 2

8

Tom solves $8 - 2x < 14$. He writes $-2x < 6$, so $x < -3$. Explain the mistake Tom has made and write the right answer.

He divided by -2 and did not turn the sign round.

Answer $x > -3$

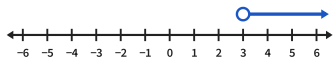
Solving Inequalities: Negatives and Brackets *further practice*

ANSWERS

9 Solve $5 - x < 2$ and show the answer on the number line.

$-x < -3$

Answer $x > 3$



10 Solve $2(3 - x) > 10$ and show the answer on the number line.

$6 - 2x > 10$

$-2x > 4$

Answer $x < -2$

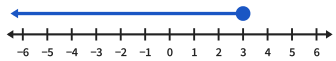


11 Solve $3(2x - 1) \leq 2x + 9$ and show the answer on the number line.

$6x - 3 \leq 2x + 9$

$4x \leq 12$

Answer $x \leq 3$



12 A tank holds 100 litres of water and 8 litres are used each day. After d days there must be more than 30 litres left. Find the greatest integer value of d.

$100 - 8d > 30$, so $-8d > -70$, $d < 8.75$

Answer 8

13 At midnight the temperature is 6 °C. It falls by 2 °C each hour. After h hours it is below −5 °C. Find the smallest integer value of h.

$6 - 2h < -5$, so $-2h < -11$

$h > 5.5$

Answer 6

14 A rectangle is $(x - 2)$ cm long and 5 cm wide. Its area is at least 40 cm². Find the smallest possible value of x.

$5(x - 2) \geq 40$

$5x \geq 50$, so $x \geq 10$

Answer 10

15 Solve $3 - 2x > x + 15$.

$-3x > 12$, so $x < -4$

or $-12 > 3x$, so $-4 > x$

Answer $x < -4$

16 Mia says that if $-x > 5$ then $x > -5$. Is Mia right? Explain.

dividing by -1 turns the sign round: $x < -5$

try $x = 0$: $0 > 5$ is false

Answer No