

Grade 7 - Two-Step Inequalities - Answer Key

Common Core 7.EE.B.4b · maths-pdf.fr/en/

Use this answer key to check your work on the inequalities worksheet. Every solution shows the steps, and the final answer appears in bold. If your answer is different, compare each step and look for the first place where the work changes.

Grade 7 · Common Core State Standards: 7.EE.B.4b

Exercise 1 - Greater than

Subtract 4 from both sides: $5x > 25$.

Divide both sides by 5: $x > 5$.

Check a value in the solution set: $x = 6$ gives $34 > 29$, which is true.

$$x > 5$$



Graph of $x > 5$ with an open circle.

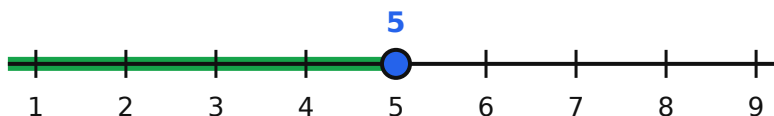
Exercise 2 - At most

Add 5 to both sides: $3x \leq 15$

Divide both sides by 3: $x \leq 5$

Check a value in the solution set: $x = 4$ gives $7 \leq 10$, which is true.

$$x \leq 5$$



Graph of $x \leq 5$: closed circle.

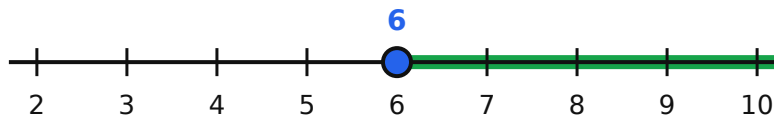
Exercise 3 - Divide by 2

Subtract 1 from both sides: $\frac{1}{2}x \geq 3$

Divide both sides by $\frac{1}{2}$: $x \geq 6$

Check a value in the solution set: $x = 7$ gives $4\frac{1}{2} \geq 4$, which is true.

$$x \geq 6$$



Graph of $x \geq 6$: closed circle.

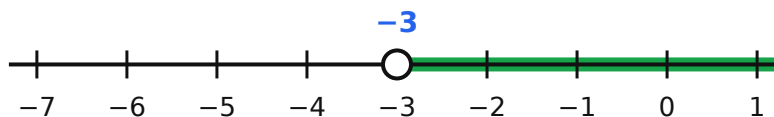
Exercise 4 - Reverse the symbol

Subtract 4 from both sides: $-2x < 6$

Divide both sides by -2 and **reverse the inequality symbol**: $x > -3$

Check a value in the solution set: $x = -2$ gives $8 < 10$, which is true.

$$x > -3$$



Graph of $x > -3$: open circle.

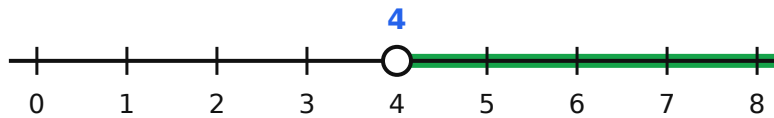
Exercise 5 - With parentheses

Divide both sides by 4: $x - 1 > 3$.

Add 1 to both sides: $x > 4$.

Check: $x = 5$ gives $4(4) = 16 > 12$, which is true.

$$x > 4$$



Graph of $x > 4$ with an open circle.

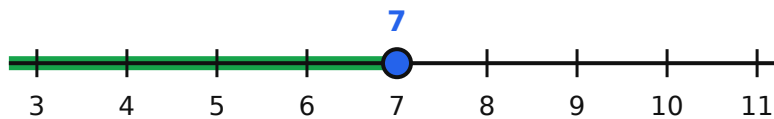
Exercise 6 - Decimals

Add 2 to both sides: $\frac{1}{2}x \leq 3\frac{1}{2}$

Divide both sides by $\frac{1}{2}$: $x \leq 7$

Check a value in the solution set: $x = 6$ gives $1 \leq 1\frac{1}{2}$, which is true.

$$x \leq 7$$



Graph of $x \leq 7$: closed circle.

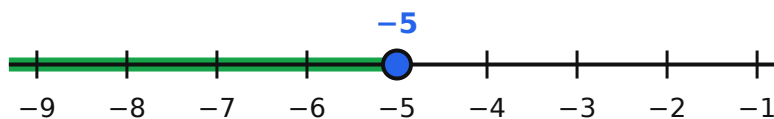
Exercise 7 - Negative at most

Add 6 to both sides: $-3x \geq 15$

Divide both sides by -3 and **reverse the inequality symbol**: $x \leq -5$

Check a value in the solution set: $x = -6$ gives $12 \geq 9$, which is true.

$$x \leq -5$$



Graph of $x \leq -5$: closed circle.

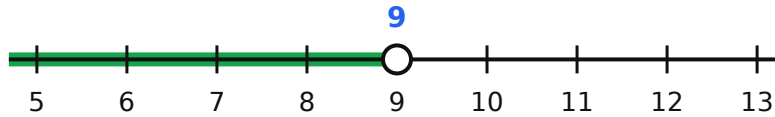
Exercise 8 - Fraction coefficient

Subtract 2 from both sides: $\frac{1}{3}x < 3$

Divide both sides by $\frac{1}{3}$: $x < 9$

Check a value in the solution set: $x = 8$ gives $4\frac{2}{3} < 5$, which is true.

$$x < 9$$



Graph of $x < 9$: open circle.

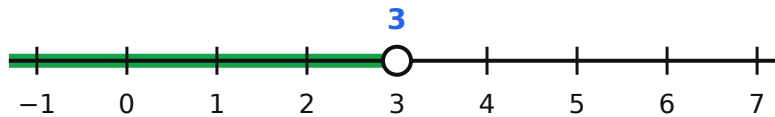
Exercise 9 - Subtract from a constant

Subtract 5 from both sides: $-x > -3$

Divide both sides by -1 and **reverse the inequality symbol**: $x < 3$

Check a value in the solution set: $x = 2$ gives $3 > 2$, which is true.

$$x < 3$$



Graph of $x < 3$: open circle.

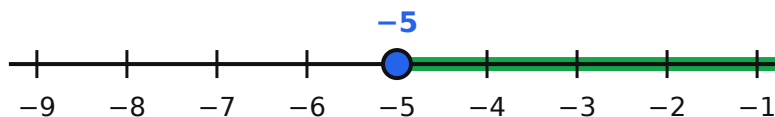
Exercise 10 - Negative outside

Divide both sides by -4 and reverse the symbol: $x + 2 \geq -3$.

Subtract 2: $x \geq -5$.

Check: $x = 0$ gives $-8 \leq 12$, which is true.

$$x \geq -5$$



Graph of $x \geq -5$ with a closed circle.

Exercise 11 - Is it a solution?

$$3(7) - 4 = 17 > 15 \text{ is true.}$$

$$3(6) - 4 = 14 > 15 \text{ is false.}$$

7 is a solution; 6 is not

Exercise 12 - Read the graph

The circle is closed at -2 and the shading goes left.

The inequality is $x \leq -2$.

Solutions: -2 and -5 . Not a solution: 0 .

$$x \leq -2$$

Exercise 13 - Ticket budget

$$6t + 4 \leq 40.$$

$$6t \leq 36, \text{ so } t \leq 6.$$

$t \leq 6$; at most 6 tickets

Exercise 14 - Earning goal

$$12h + 13 \geq 85.$$

$$12h \geq 72, \text{ so } h \geq 6.$$

$h \geq 6$; at least 6 hours

Exercise 15 - Elevator limit

$$45b + 150 \leq 1000.$$

$$45b \leq 850, \text{ so } b \leq 18.9 \text{ (about).}$$

At most 18 boxes

Exercise 16 - Cooling down

$$50 - 4h < 32.$$

$$-4h < -18.$$

Divide by -4 and reverse the symbol: $h > 4.5$.

$h > 4.5$; after 4.5 hours, so by hour 5 it is below 32°F

Hour	Temp
0	50
4	34
4.5	32
5	30

Temperature by hour.

Exercise 17 - Savings plan

$$120 - 15w \geq 30.$$

$$-15w \geq -90.$$

Divide by -15 and reverse: $w \leq 6$

$w \leq 6$; at most 6 weeks

Weeks	Money left
5	\$45
6	\$30
7	\$15

Money left.

Exercise 18 - Taxi fare

$$2.25m + 3.5 \leq 20.$$

$$2.25m \leq 16.5, \text{ so } m \leq 7.33 \text{ (about).}$$

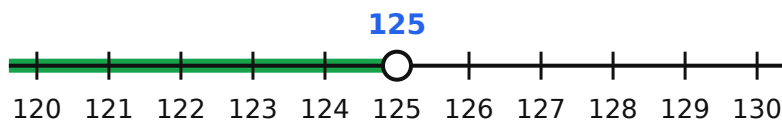
At most 7 miles

Exercise 19 - Phone minutes

$$0.08m + 15 < 25.$$

$$0.08m < 10, \text{ so } m < 125.$$

$m < 125$; fewer than 125 minutes



$m < 125$ on a number line.

Exercise 20 - Car wash goal

$$3.5c + 45 > 150.$$

$$3.5c > 105, \text{ so } c > 30.$$

Because c must be a whole number greater than 30, the least is 31.

$c > 30$; at least 31 cars