

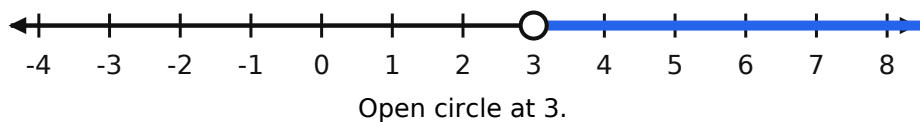
Algebra 1 - Linear Inequalities in One Variable - Answer Key

Common Core A-REI.B.3, A-CED.A.1 · maths-pdf.fr/en/

Use this key to check your work on the linear inequalities worksheet. Every solution shows the steps, and the final answer appears in bold. If your answer differs, find the first line where your work and the key disagree, then redo the problem from there without looking.

Algebra 1 · Common Core State Standards: **A-REI.B.3, A-CED.A.1**

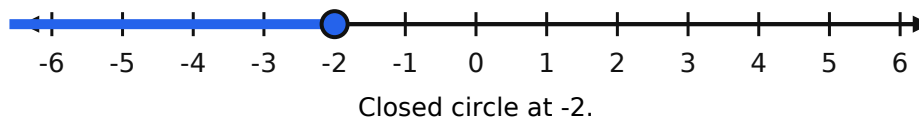
Exercise 1 - Graph x greater than 3



Because 3 is not included, use an open circle at 3 and shade to the right.

Open circle at 3, ray to the right

Exercise 2 - Graph with a closed circle



Because -2 is included, use a closed circle at -2 and shade to the left.

Closed circle at -2, ray to the left

Exercise 3 - Write from a graph

The circle at 1 is closed, so 1 is included. The ray points right, to greater values.

$$x \geq 1$$

Exercise 4 - Add and compare

Subtract 5 from both sides: $x < 7$.

$$x < 7$$

Exercise 5 - Subtract on both sides

Add 4 to both sides: $x \geq 3$.

$$x \geq 3$$

Exercise 6 - Divide by a positive

Divide both sides by 3. The symbol stays the same: $x > 6$.

$$x > 6$$

Exercise 7 - Divide by a negative

Divide both sides by -2 and reverse the symbol: $x \geq -5$.

$$x \geq -5$$

Exercise 8 - Divide by a negative fraction form

Multiply both sides by -3 and reverse the symbol: $x > -12$.

$$x > -12$$

Exercise 9 - Two-step

Add 5: $2x \geq 14$. Divide by 2: $x \geq 7$.

$$x \geq 7$$

Exercise 10 - Two-step with a negative

Subtract 4: $-3x > 15$.

Divide by -3 and reverse the symbol: $x < -5$.

$$x < -5$$

Exercise 11 - Variables on both sides

Subtract $3x$: $2x + 2 \leq 12$. Subtract 2: $2x \leq 10$.

Divide by 2: $x \leq 5$.

$$x \leq 5$$

Exercise 12 - Distribute

Distribute: $4x - 8 < 2x + 6$. Subtract $2x$: $2x - 8 < 6$.

Add 8: $2x < 14$. Divide by 2: $x < 7$.

$$x < 7$$

Exercise 13 - Fraction coefficient

Add 1: $\frac{2}{3}x \geq 6$.

Multiply by $\frac{3}{2}$ (positive, so the symbol stays): $x \geq 9$.

$$x \geq 9$$

Exercise 14 - And compound



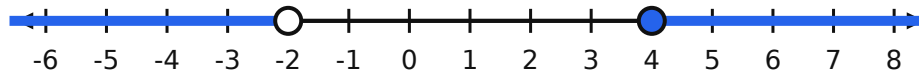
Closed circle at -1, open circle at 3.

Add 2 to all three parts: $-3 \leq 3x < 9$.

Divide all parts by 3: $-1 \leq x < 3$.

$$-1 \leq x < 3$$

Exercise 15 - Or compound



Two separate rays.

First inequality: $x < -2$. Second inequality: $x \geq 4$.

$$x < -2 \text{ or } x \geq 4$$

Exercise 16 - Smoothies

Total cost cannot exceed \$60: $4.50s \leq 60$.

Divide by 4.50: $s \leq 13.\bar{3}$.

She can buy only a whole number of smoothies, and the table shows 13 cost \$58.50 while 14 cost \$63.

13 smoothies

Exercise 17 - Saving for a bike

At least \$200: $44 + 12n \geq 200$.

Subtract 44: $12n \geq 156$. Divide by 12: $n \geq 13$.

13 lawns

Exercise 18 - Elevator limit

Total weight: $180 + 45b \leq 1000$.

Subtract 180: $45b \leq 820$. Divide by 45: $b \leq 18.\bar{2}$.

Check: 18 boxes weigh $180 + 810 = 990$ pounds, but 19 boxes weigh 1,035 pounds.

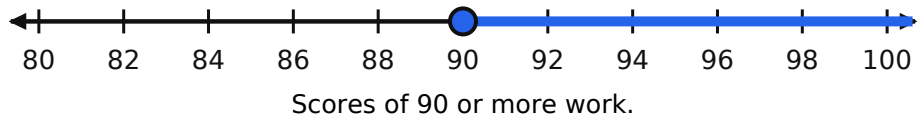
18 boxes

Exercise 19 - Phone plans

$30 + 0.10t < 45$. Subtract 30: $0.10t < 15$. Divide by 0.10: $t < 150$.

Fewer than 150 texts

Exercise 20 - Average score

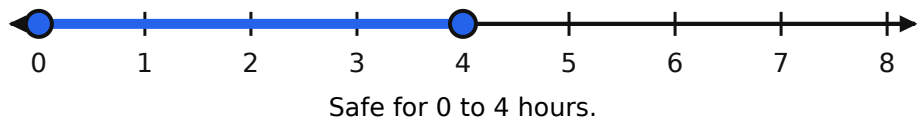


$\frac{82+90+78+x}{4} \geq 85$. Multiply by 4: $250 + x \geq 340$.

Subtract 250: $x \geq 90$.

At least 90

Exercise 21 - Cooler temperature



$34 \leq 34 + 1.5h \leq 40$. Subtract 34 from every part: $0 \leq 1.5h \leq 6$.

Divide by 1.5: $0 \leq h \leq 4$.

0 to 4 hours