

Linear Inequalities: Worksheet 1 Marking Guide

Total: 42 marks. Award marks for correct working even when the final answer is wrong, unless a question says otherwise.

Section A: Solve each inequality

2 marks each: 1 for the working, 1 for the answer

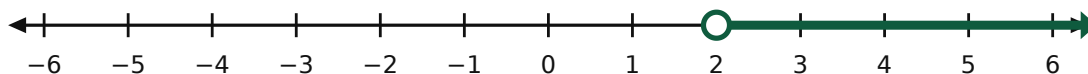
- | | | | |
|--|-----|---|-----|
| <p>1. $x + 5 > 12$
 $x > 12 - 5$
 $x > 7$</p> | [2] | <p>2. $3x \leq 18$
 $x \leq 18 \div 3$
 $x \leq 6$</p> | [2] |
| <p>3. $2x - 4 < 10$
 $2x < 14$
 $x < 7$</p> | [2] | <p>4. $5x + 3 \geq 28$
 $5x \geq 25$
 $x \geq 5$</p> | [2] |
| <p>5. $4 - x > 1$
 $-x > -3$ (sign reverses)
 $x < 3$</p> | [2] | <p>6. $-3x < 12$
 $x > 12 \div (-3)$ (sign reverses)
 $x > -4$</p> | [2] |
| <p>7. $7 - 2x \leq 1$
 $-2x \leq -6$ (sign reverses)
 $x \geq 3$</p> | [2] | <p>8. $\frac{x}{2} + 3 > 5$
 $\frac{x}{2} > 2$
 $x > 4$</p> | [2] |
| <p>9. $3(x - 2) < 15$
 $x - 2 < 5$
 $x < 7$</p> | [2] | <p>10. $2x + 1 \geq x + 6$
 $2x - x \geq 6 - 1$
 $x \geq 5$</p> | [2] |

Accept equivalent forms, for example $7 < x$ for question 1 and $3 > x$ for question 5. If a learner does not reverse the sign in questions 5, 6 and 7, award the working mark only.

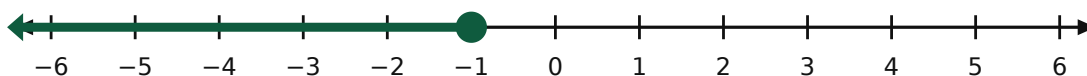
Section B: Number lines

9 marks

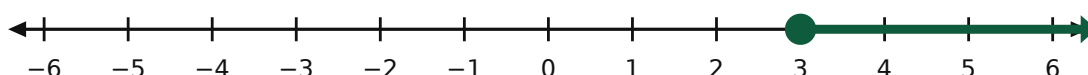
- 11.** $x > 2$: open circle at 2 and a line with an arrow pointing right. [2]
 1 mark for the open circle at 2, 1 mark for the arrow pointing right.



- 12.** $x \leq -1$: closed circle at -1 and a line with an arrow pointing left. [2]
 1 mark for the closed circle at -1, 1 mark for the arrow pointing left.



- 13.** $2x - 1 \geq 5$, so $2x \geq 6$, so $x \geq 3$. Closed circle at 3, arrow pointing right. [3]
 1 mark for $2x \geq 6$, 1 mark for $x \geq 3$, 1 mark for the correct number line.



- 14.** (a) $x > -2$ (open circle, arrow right) (b) $x \leq 3$ (closed circle, arrow left) [2]
 1 mark each.

Section C: Real-life problems

9 marks

15. $p + 14 \leq 60$ [1] [3]
 $p \leq 46$ [1]
At most 46 more passengers can get on. [1]
16. $45b \leq 500$ [1] [3]
 $b \leq 500 \div 45 = 11 \frac{1}{9}$ [1]
She can buy at most 11 books, because the number of books must be a whole number. [1]
17. $6x \leq 240$ [1] [3]
 $x \leq 40$ [1]
At most 40 learners can share the pencils. [1]

Section D: Challenge

4 marks

18. $3x - 7 < 11$, so $3x < 18$, so $x < 6$ [1] [2]
Greatest integer: 5 [1] (not 6, because x must be less than 6)
19. $5 - 2x < 3$, so $-2x < -2$, so $x > 1$ [1] [2]
Smallest integer: 2 [1] (not 1, because x must be greater than 1)

Mark summary

Section	Topic	Marks
A	Solving inequalities	20
B	Number lines	9
C	Real-life problems	9
D	Challenge	4
Total		42

Common mistakes to look for

- Not reversing the inequality sign when multiplying or dividing by a negative number (questions 5, 6, 7 and 19).
- Using an open circle for $\leq$ or $\geq$, or a closed circle for $<$ or $>$.
- Giving $11 \frac{1}{9}$ books or 6 as the greatest integer in questions 16 and 18. The context or the strict sign limits the answer.
- Arrow pointing the wrong way. Ask learners to test one number from the shaded part in the original inequality.