

GRADE 8 MATHEMATICS

Inequalities & Number Lines

Complete Printable Worksheet Pack

6 Practice Worksheets • 6 Answer Keys

Solve • Represent • Interpret • Explain

Name: _____ Date: _____

Worksheet 1 — Understanding Inequalities

Show your working. For number-line questions, describe the graph clearly.

1. Write the correct symbol: $7 \underline{\hspace{1cm}} 12$.
2. Write the correct symbol: $-3 \underline{\hspace{1cm}} -8$.
3. Write the correct symbol: $5 \underline{\hspace{1cm}} 5$.
4. Write all integers greater than -2 and less than 4 .
5. Is 6 a solution of $x > 4$? Explain.
6. Is -5 a solution of $x \geq -5$? Explain.
7. Write an inequality for: a number is less than 9 .
8. Write an inequality for: a number is at least 12 .
9. Which is larger: -2.5 or -2.05 ? Explain using a number line idea.
10. Challenge: Find three integers satisfying $-7 < x \leq 1$.

Working space:

Answer Key 1 — Understanding Inequalities

1. $<$
2. $>$
3. $=$
4. $-1, 0, 1, 2, 3$
5. Yes
6. Yes
7. $x < 9$
8. $x \geq 12$
9. -2.05 is larger because it lies farther right on the number line
10. $-6, -5, -4$ (many answers possible)

Worksheet 2 — Solving One-Step Inequalities

Show your working. For number-line questions, describe the graph clearly.

1. Solve: $x + 5 > 12$.
2. Solve: $y - 7 \leq 10$.
3. Solve: $3a < 21$.
4. Solve: $b/4 \geq 6$.
5. Solve: $m + 9 \geq 2$.
6. Solve: $p - 8 < -3$.
7. Solve: $5r > 35$.
8. Solve: $q/3 \leq -4$.
9. Write an inequality whose solution is $x \geq 15$.
10. Challenge: Solve $2x - 7 > 13$.

Working space:

Answer Key 2 — Solving One-Step Inequalities

1. $x > 7$

2. $y \leq 17$

3. $a < 7$

4. $b \geq 24$

5. $m \geq -7$

6. $p < 5$

7. $r > 7$

8. $q \leq -12$

9. $x \geq 15$

10. $x > 10$

Worksheet 3 — Multiplying, Dividing & Reversing the Sign

Show your working. For number-line questions, describe the graph clearly.

1. Solve: $-2x > 10$.

2. Solve: $-3y \leq 18$.

3. Solve: $-5a < 25$.

4. Solve: $-4m \geq 20$.

5. Solve: $6p \leq -30$.

6. Solve: $-7r > -42$.

7. Explain why the inequality sign changes when both sides are multiplied or divided by a negative number.

8. Solve: $-2x + 5 \geq 13$.

9. Solve: $4 - 3n < 16$.

10. Challenge: Solve $-5(2x - 1) \geq 35$.

Working space:

Answer Key 3 — Multiplying, Dividing & Reversing the Sign

1. $x < -5$

2. $y \geq -6$

3. $a > -5$

4. $m \leq -5$

5. $p \leq -5$

6. $r < 6$

7. Multiplying or dividing by a negative reverses the order of numbers on the number line.

8. $x \leq -4$

9. $n > -4$

10. $x \leq -3$

Worksheet 4 — Number Lines & Graphing Solutions

Show your working. For number-line questions, describe the graph clearly.

1. Describe how you would graph $x > 3$ on a number line.
2. Describe how you would graph $x \leq -2$.
3. For $x \geq 5$, should the point at 5 be open or closed? Explain.
4. For $x < -1$, should the point at -1 be open or closed?
5. Give two integer solutions of $x < 4$.
6. Give three integer solutions of $x \geq -3$.
7. Write an inequality represented by an open point at 2 with shading to the left.
8. Write an inequality represented by a closed point at -4 with shading to the right.
9. Which is the larger solution set: $x > 2$ or $x \geq 2$? Explain the difference.
10. Challenge: Describe the number-line graph for $-3 < x \leq 4$.

Working space:

Answer Key 4 — Number Lines & Graphing Solutions

1. Open point at 3, shade right.
2. Closed point at -2 , shade left.
3. Closed, because 5 is included.
4. Open, because -1 is not included.
5. Examples: 0 and 3
6. Examples: -3 , 0, 5
7. $x < 2$
8. $x \geq -4$
9. $x \geq 2$ is larger because it includes 2 as well as all numbers greater than 2.
10. Open at -3 , closed at 4, shade between them.

Worksheet 5 — Inequalities in Real-Life Problems

Show your working. For number-line questions, describe the graph clearly.

1. A child must be at least 12 years old to enter an activity. Write an inequality for age a .
2. A bag may weigh no more than 20 kg. Write an inequality for weight w .
3. A student needs more than 70 points to qualify. Write an inequality for score s .
4. A budget is \$150. A person has already spent \$85 and wants to buy items costing \$12 each. How many items can be bought?
5. A taxi charges \$6 plus \$3 per kilometre. A passenger has at most \$30. How far can they travel?
6. A phone plan costs \$20 plus \$5 per GB. A customer can spend no more than \$55. What is the maximum number of GB?
7. A box can hold at most 48 books. There are already 17 books. Each new bundle contains 5 books. How many bundles can be added?
8. A runner wants to finish a race in less than 50 minutes. Their current estimate is 42 minutes plus 2 minutes for each stop. How many stops can they make?
9. A concert requires attendees to be at least 16 years old. Is a 15-year-old eligible? Explain.
10. Challenge: A school trip costs \$25 per student plus a fixed \$120 bus fee. The budget is \$620. What is the greatest number of students who can attend?

Working space:

Answer Key 5 — Inequalities in Real-Life Problems

1. $a \geq 12$
2. $w \leq 20$
3. $s > 70$
4. $85 + 12n \leq 150$, so $n \leq 5$; 5 items
5. $6 + 3k \leq 30$, so $k \leq 8$ km
6. $20 + 5g \leq 55$, so $g \leq 7$ GB
7. $17 + 5b \leq 48$, so $b \leq 6$ bundles
8. $42 + 2s < 50$, so $s < 4$; maximum 3 stops
9. No; $15 < 16$
10. $25s + 120 \leq 620$, so $s \leq 20$ students

Worksheet 6 — Inequalities Challenge & Reasoning

Show your working. For number-line questions, describe the graph clearly.

1. Solve: $4x - 7 \leq 21$.
2. Solve: $3 - 2y > 11$.
3. Solve: $5(2a - 1) \geq 35$.
4. Solve: $2(x + 4) < 18$.
5. Solve: $-3(2m - 5) \leq 21$.
6. Solve: $4p + 7 > 2p - 9$.
7. A student solves $-2x > 8$ as $x > -4$. Identify the error and give the correct solution.
8. Find all integers satisfying $-4 \leq x < 3$.
9. Find the greatest integer satisfying $5x - 2 \leq 18$.
10. Challenge: Solve and describe the number-line solution: $-2 < 3x + 1 \leq 10$.

Working space:

Answer Key 6 — Inequalities Challenge & Reasoning

1. $x \leq 7$
2. $y < -4$
3. $a \geq 4$
4. $x < 5$
5. $m \geq -1$
6. $x > -8$
7. The sign must reverse when dividing by -2 ; correct solution is $x < -4$
8. $-4, -3, -2, -1, 0, 1, 2$
9. $x \leq 4$, so greatest integer is 4
10. Subtract 1: $-3 < 3x \leq 9$; divide by 3: $-1 < x \leq 3$. Open at -1 , closed at 3, shade between.