

Linear Inequalities: math test solutions, Grade 9 – download the PDF

Test solutions with the detailed point scale. Add up your points and spot what to review.

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Solving inequalities

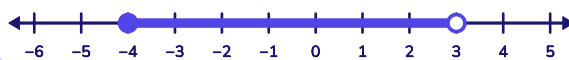
/ 4 pts

- a. $3x \leq 18$, so $x \leq 6$. (1 pt)
- b. $-4x > 16$; dividing by -4 reverses the sign: $x < -4$. (1.5 pt)
- c. $2x - 6 \geq 5x + 6$ gives $-12 \geq 3x$, so $x \leq -4$. (1.5 pt)

2 Compound inequalities

/ 3 pts

- a. Subtract 3: $-8 \leq 2x < 6$. Divide by 2: $-4 \leq x < 3$. Graph: closed circle at -4 , open circle at 3, segment shaded. (1.5 pt)
- b. $x < -3$ or $x \geq 5$. (1.5 pt)



3 Absolute value equations

/ 4 pts

- a. $x - 6 = 4$ gives $x = 10$; $x - 6 = -4$ gives $x = 2$. (1 pt)
- b. $2|x + 1| = 12$, so $|x + 1| = 6$. Then $x = 5$ or $x = -7$. (2 pt)
- c. An absolute value cannot be -1 : no solution. (1 pt)

4 Absolute value inequalities

/ 3 pts

- a. $-5 \leq x + 2 \leq 5$, so $-7 \leq x \leq 3$. (1.5 pt)
- b. $2x - 1 > 9$ gives $x > 5$; $2x - 1 < -9$ gives $x < -4$. So $x < -4$ or $x > 5$. (1.5 pt)

5 Modeling

/ 4 pts

- (a) $4w - 30 \geq 250$ gives $4w \geq 280$, so $w \geq 70$: at least 70 wristbands. (2 pt)
- (b) $|p - 12| \leq 0.5$ gives $11.5 \leq p \leq 12.5$ pounds. In kilograms: $11.5 \times 0.4536 \approx 5.22$ and $12.5 \times 0.4536 \approx 5.67$, so about 5.22 kg to 5.67 kg. (2 pt)

6 True or false

/ 2 pts

- a. False. Subtracting $4x$ gives $1 < 9$, always true, so every real number is a solution. (1 pt)
- b. False. Dividing by -3 reverses the sign: $x \leq -4$. (1 pt)



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