Linear equations and graphs: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

Copy and complete the table of values for y = 2x + 1.

x	-2	-1	0	1	2
y					

Question 2

Solve:

(a) x + 7 = 12

(b) 3x = 21

(c) x/4 = 5

(d) 2x - 3 = 11

Question 3

(a) Does the point (3, 7) lie on the line y = 2x + 1? Show how you know.

(b) Does the point (-1, 2) lie on the line y = 2x + 1? Show how you know.

Question 4

For the line y = 3x - 6, write the coordinates of the point where it crosses:

(a) the y-axis

(b) the x-axis

Section B: Standard (Questions 5-10)

Question 5

Solve:

(a) $5x + 4 = 3x + 18$

(b) $3(x - 2) = 2x + 5$

(c) $(x + 3)/(2) = 8$

Question 6

Solve:

(a) $10 - 3x = 1$

(b) $-2x + 7 = -9$

Question 7

Solve each inequality.

(a) $x + 5 > 9$

(b) $3x \leq 18$

(c) $2x - 7 \geq 5$

(d) Describe how you would show your answer to (c) on a number line.

Question 8

(a) Solve $-4x < 20$.

(b) Explain why the inequality sign changes direction in this question.

(c) Check your answer by testing $x = 0$ and $x = -6$ in the original inequality.

Question 9

(a) Copy and complete the table of values for $y = -x + 4$.

x	-1	0	1	2	3	4
y						

(b) Describe the graph of $y = -x + 4$: does it slope upwards or downwards from left to right, and where does it cross each axis?

Question 10

The lines $y = 2x + 1$ and $y = x + 4$ are drawn on the same set of axes.

(a) Copy and complete the table.

x	0	1	2	3	4
y = 2x + 1					

$y = x + 4$

(b) At what point do the two lines cross?

(c) Which equation does the x-coordinate of that point solve? Check your answer algebraically.

Linear equations and graphs: answers

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Question 1

Answer: y = -3, -1, 1, 3, 5

Question 2

Answer: (a) x = 5 (b) x = 7 (c) x = 20 (d) x = 7

Question 3

Answer: (a) Yes: 2 × 3 + 1 = 7 (b) No: 2 × (-1) + 1 = -1, not 2

Question 4

Answer: (a) (0, -6) (b) (2, 0)

Question 5

Answer: (a) x = 7 (2x = 14) (b) x = 11 (3x - 6 = 2x + 5) (c) x = 13 (x + 3 = 16)

Question 6

Answer: (a) x = 3 (-3x = -9) (b) x = 8 (-2x = -16)

Question 7

Answer: (a) $x > 4$ (b) $x \leq 6$ (c) $x \geq 6$ (d) A filled (closed) dot at 6 with an arrow pointing to the right.

Question 8

Answer: (a) $x > -5$ (b) We divided both sides by a negative number (-4), which reverses the order, so the sign must be reversed. (c) x = 0: $0 < 20$ is true, and $0 > -5$; x = -6: $24 < 20$ is false, and -6 is not greater than -5. Both agree with $x > -5$.

Question 9

Answer: (a) y = 5, 4, 3, 2, 1, 0 (b) A straight line sloping downwards from left to right, crossing the y-axis at (0, 4) and the x-axis at (4, 0).

Question 10

Answer: (a) y = 2x + 1: 1, 3, 5, 7, 9; y = x + 4: 4, 5, 6, 7, 8 (b) (3, 7) (c) 2x + 1 = x + 4; solving gives x = 3