Year 9 Equations and Inequalities – Challenge

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Answers and worked solutions · 8 questions

A. Think like a mathematician

1. Mistake: r^2 was halved instead of square-rooted. Correct: $r = \sqrt{(A/16)}$

Error: r^2 was halved instead of square-rooted

$r^2 = A/16$

$r = \sqrt{(A/16)} = \sqrt{A}/4$

2. Mistake: 9 must be subtracted before dividing by 2. Correct: $x = (y - 9)/2$

Error: 9 must be subtracted before dividing by 2

$y - 9 = 2x$

$x = (y - 9)/2$

3. Yes. x + y cannot be 4 and 6 at once; on a graph the lines are parallel.

Substitute values, or rearrange

x + y cannot be 4 and 6 at once; on a graph the lines are parallel.

Decide

4. No. x > 2 is true for infinitely many values, e.g. 3, 2.5 and 100.

Substitute values, or rearrange

x > 2 is true for infinitely many values, e.g. 3, 2.5 and 100.

Decide

5. No. x + y = 5 is true; 3x + 2y = 12, not 14, so it is not the solution.

Substitute x = 2 and y = 3 into both equations

First: 5; second: 12

A solution must make both equations true

6. x + 2x + 30 + 3x − 6 = 180; x = 26

x + 2x + 30 + 3x − 6 = 180

6x + 24 = 180; x = 26

7. adult $9, child $4

2a + 5c = 38 and 1a + 3c = 21

Eliminate one letter, solve, then substitute back: adult $9, child $4

8. $5 + 3d \leq 39$; 11 km

$5 + 3d \leq 39$

$3d \leq 34$, so $d \leq 11\ 1/3$; Greatest whole number: 11