FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

A17: Linear equations

Reason with solving linear equations

20 marks · 25 minutes · Non-calculator

1) Ana solves $3x + 5 = 20$ and gets $x = \frac{25}{3}$. Explain her mistake and give the correct solution.

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[Question 1: 2 marks]

2) Show that $x = 4$ is the solution of $5(x - 2) = 2x + 2$

[Question 2: 2 marks]

3) Explain why $2(x + 3) = 2x + 5$ has no solution.

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[Question 3: 2 marks]

4) Explain why $3(x + 2) = 3x + 6$ is true for every value of x.

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[Question 4: 2 marks]

5) Show that the solution of $\frac{x+1}{3} = \frac{x-1}{2}$ is $x = 5$

[Question 5: 2 marks]

6) Ben solves $4 - x = 10$ and gets $x = 6$. Explain his mistake.

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[Question 6: 2 marks]

7) A rectangle has sides $(2x + 1)$ cm and $(x + 4)$ cm. Its perimeter is 40 cm. Show that $x = 5$

[Question 7: 3 marks]

8) Is $x = -2$ a solution of $3x + 7 = x + 3$? Show how you decide.

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[Question 8: 2 marks]

9) Solve $5x - 3 = 2x + 9$. Explain each step.

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[Question 9: 3 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	5	She added 5 instead of subtracting (C1); $x = 5$ (B1).
2	Shown	$10 = 10$ (M1); C1.
3	Explanation	$2x + 6 = 2x + 5$ leads to $6 = 5$ (M1); impossible (C1).
4	Explanation	Expanding gives $3x + 6$ on both sides (M1); identity (C1).
5	Shown	$2(x + 1) = 3(x - 1)$ (M1); C1.
6	-6	$-x = 6$ so $x = -6$ (C1); B1.
7	Shown	$2(2x + 1) + 2(x + 4) = 40$ (M1); $6x + 10 = 40$ (M1); C1.
8	Yes	Both sides equal 1 (M1); C1.
9	4	Subtract $2x$ (C1); add 3 (C1); divide by 3, $x = 4$ (C1).