Mark scheme

Linear equations

Mathematics 0580 · Questions from Paper 1, Paper 2, Paper 3 and Pape…

Total marks

47

MARKS FOR EACH QUESTION

1	2	3	4	5	6	7	8	9	10	Total
2	2	2	3	3	3	5	8	5	14	**47**

Question 1 **[2]**

1	2.25 oe	**2**	**M1** $4x = 7 + 2$ **OR** $x - \frac{2}{4} = \frac{7}{4}$ or better

Question 2 **[2]**

2	7	**2**	**M1** for $36.5[0] - 12 = 3.5y$ or better

Question 3 **[2]**

3	72	**2**	**M1** for 12^2 [÷ 2]

Question 4 **[3]**

4	$3n - 5 = 22$	**1**	
	9 final answer	**2**	**B2FT** their equation providing their equation is in the form $an+b=22$ where $a \neq 0$ or 1 and $b \neq 0$ or **M1FT** for $3n = 22 + 5$ or $n - \frac{5}{3} = \frac{22}{3}$

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Question 5 **[3]**

5	2.8 oe	**3**	**M2** for $12 + 2 = 8x - 3x$ or better or **M1** for $3x + 12$ or $8x - 2$

Question 6 **[3]**

6	17.5[0] cao	**3**	**M1** for $12n + 9(n - 10) = 277.50$ oe **M1** dep on *their* equation using n and $n - 10$ for simplifying *their* equation correctly to $an = b$

Question 7 **[5]**

7	–5	**5**	**B3** for $x = 4$ or **M2** for $5x + 3x = 30 + 2$ or better or **M1** for $5x - 2 = 3(10 - x)$ or better **M1** $10 -$ *their* $x = y + 11$ or better or $\frac{5 \times \text{their } x - 2}{3} = y + 11$ or better Alternative method: **B4** for $3y + 5y = -5 - 2 - 33$ or **B3** for $-5 - 5y - 2 = 3y + 33$ or **B2** for $\frac{5(-1-y)-2}{3} = y + 11$ or **B1** for $x = -1 - y$

Question 8 **[8]**

8 (a)	If x is more than 11 then $11 - x$ would be negative oe	**1**	
(b)	$14 + 4x$ cao accept $2(2x + 7)$	**2**	**M1** for $2x + 3 + 11 - x + 3x$
(c) (i)	4.5 cao	**3**	**B1**ft for "their (b)" = 32 **M1**ft for collecting their like terms correctly to give simplified expression of form $ax = b$ OR **M1**ft $x = \frac{b}{a}$
(ii)	6.5	**2ft**	**M1**ft for clear attempt at substituting their (c)(i) into 2 or more sides of triangle

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Question 9 **[5]**

9	$x = 3$, $x = -3$ nfww	**5**	**M2** for $x + 9 + 9(x + 1) = (x + 1)(x + 9)$ oe or better or **M1** for $x + 9 + 9(x + 1)$ or $(x + 1)(x + 9)$ oe or better **B1** for $x^2 + x + 9x + 9$ seen **M1 dep** for $[0 =]x^2 - 9$ oe simplified or better

Question 10 **[14]**

10(a)(i)	$x(3x + 4) + 2(x - 1)[= 20]$	**M1**	Correct expression with brackets unexpanded
	Leading to $3x^2 + 6x - 22 = 0$ with no errors or omissions	**A1**	Must see equated to 20 and brackets expanded first to award A1
10(a)(ii)	$\frac{-6 \pm \sqrt{6^2 - 4(3)(-22)}}{2.3}$ oe or for $= -1 \pm \sqrt{1 + \frac{22}{3}}$ oe	**B2**	**B1** for $\sqrt{6^2 - 4(3)(-22)}$ or $\frac{-6 + \text{or} - \sqrt{k}}{2.3}$ or $(x + 1)^2 = k$ oe
	–3.887 and 1.887 cao	**B2**	**B1** for one correct answer or for answers –3.89 or – 3.88 or -3.886 or –3.8868 to –3.8867 and 1.88 or 1.89 or 1.886 or 1.8867 to 1.8868 or correct answers seen in working or –1.887 and 3.887 answers
10(a)(iii)	5.77 or 5.773 to 5.774	**1**	**FTdep** 2(positive x +1) evaluated to 3 sig. fig. or more, dep on $x > 1$
10(b)	$y^2 + 3y - 40[= 0]$ oe	**B4**	Oe 3 term quadratic **M3** for $15y - 20(y - 2) = y(y - 2)$ oe Or **M2** for $\frac{15}{y - 2} - \frac{20}{y} = 1$ oe Or **M1** for $H(y - 2) = 15$ or $hy = 20$ soi
	$(y + 8)(y - 5)$ [= 0] oe	**B2**	**Strict FT** a three term quadratic **B1FT** for $(y + a)(y + b)$ where $ab = -40$ or $a + b = 3$ or y(y – 5) + 8 (y – 5) or $y(y + 8) - 5(y + 8)$
	5	**B1**	

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