Higher MUD Straight Line 1

Marking Scheme

(1) $M_{RS} = \dfrac{y_2 - y_1}{x_2 - x_1}$ $\qquad$ $M_{ST} = \dfrac{y_2 - y_1}{x_2 - x_1}$

$M_{RS} = \dfrac{-3-12}{1-(-2)}$ $\qquad$ $M_{ST} = \dfrac{-23-(-3)}{5-1}$

$M_{RS} = -\dfrac{15}{3}$ $\qquad$ $M_{ST} = -\dfrac{20}{4}$

$M_{RS} = -\underline{\underline{5}}$. ✓ $\qquad$ $M_{ST} = -\underline{\underline{5}}$. ✓

Since $M_{RS} = M_{ST}$ and S is a common point, R, S and T are collinear. . ✓ (3)

(2) $3y - 2x = 4$

$3y = 2x + 4$

$y = \frac{2}{3}x + \frac{4}{3}$. ✓

$\therefore M_{AB} = \frac{2}{3}$. ✓

$M_{AB} = \dfrac{y_2 - y_1}{x_2 - x_1}$ $\qquad$ $M_{AB} = \dfrac{a-2}{12}$. ✓

$M_{AB} = \dfrac{a-2}{5-(-7)}$

ie// $\frac{a-2}{12} = \frac{2}{3}$ ✓

$3(a-2) = 24$

$3a - 6 = 24$

$3a = 30$ (5)

$a = \underline{\underline{10}}$ ✓

(3) $y + 4x = 7$

$y = -4x + 7$

$\therefore$ m of line $= -4$ ✓

$y - b = m(x - a)$ $\quad \begin{cases} m = -4 \\ a = -2 \\ b = 3 \end{cases}$

$y - 3 = -4(x - (-2))$ ✓

$y - 3 = -4(x + 2)$

$y - 3 = -4x - 8$

$y = -4x - 8 + 3$ (3)

$y = -4x - 5$ ✓ OR $4x + y + 5 = 0$

(4) $x - 4y + 7 = 0$

$-4y = -x - 7 \quad \times -1$

$4y = x + 7$

$y = \frac{1}{4}x + \frac{7}{4}$

$\therefore m = \frac{1}{4}$ ✓ $\Rightarrow m_{\perp}$ line $= \underline{\underline{-4}}$ ✓

$y - b = m(x - a)$

$y - 3 = -4(x - 2)$ ✓

$y - 3 = -4x + 8$

$y = -4x + 8 + 3$

$\begin{cases} m = -4 \\ a = 2 \\ b = 3 \end{cases}$

4

$y = -4x + 11$ ✓ OR $4x + y - 11 = 0$

Total marks = 15