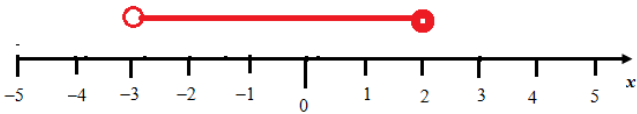


Question	Scheme	Mark	Notes
13	$4x^2 + 45 = 9x^2$ Condone lack of brackets for M1 only $45 = 5x^2$ (oe) $x = 3$ Accept $x = \pm 3$	3	M1 M1 (DEP) A1
14	$\sqrt{(\sqrt{8})^2 + 1^2}$ or 3 (Pythagoras) $\therefore (3) \left(\frac{\sqrt{8}}{\sqrt{(\sqrt{8})^2 + 1^2}} + \frac{1}{\sqrt{(\sqrt{8})^2 + 1^2}} \right)$ $1 + \sqrt{8}$ NB: No working shown scores M0 M0 A0 even if correct answer given.	3	M1 M1 (DEP) A1
15	(a) 3, 6, 9, 12, 15 only (b) $C = \{6, 12, 18, \dots, 48\}$ First B mark in (b) can be implied by $(A \cap B) \cap C' = \{3, 9, 15\}$ (so $C' = \{3, 9, \dots, 45\}$) $\therefore (A \cap B) \cap C' = \{3, 9, 15\}$ NB: ft on "(a)" $n([A \cap B] \cap C') = 3$ (cao)	1 3	B1 B1 B1 B1
16	(a) $\begin{pmatrix} -9 & -25 \\ -4 & 26 \end{pmatrix}$ (b) $\begin{pmatrix} -5 & 1 & 12 \\ 0 & -14 & -28 \end{pmatrix}$	2 2	B2 (-1eeoo) B2 (-1eeoo)

Question	Scheme	Mark	Notes
17	$\text{New } R = \frac{x \times 1.05}{y \times 0.75} \quad \text{or} \quad \frac{1.05}{0.75} \quad (\text{oe})$ $= \frac{7}{5} R \text{ or } 1.4 \text{ or } 140 \quad (\text{oe})$ $\therefore \text{increase} = \frac{\left(\frac{7}{5} - 1\right) R}{R} \times 100 \quad (\text{oe})$ <p>3rd M mark for correct method to convert to required % e.g. $140 - 100, (1.4 - 1.0) \times 100$, etc. 40%</p>	4	M1 A1 M1 (DEP) A1
18	$w(5y - 2x) = 2(x + 3y) + 2(5y - 2x)$ <p style="text-align: right;">(removing denominators correctly)</p> $5yw - 2xw = 2x + 6y + 10y - 4x \quad (\text{expanding})$ <p>(OR $w(5y - 2x) = 2(8y - x)$ (removing denominators) $5yw - 2xw = 16y - 2x \quad (\text{expanding})$)</p> $5yw - 16y = -2x + 2xw \quad (\text{collecting terms in } y)$ $y = \frac{2x(w-1)}{(5w-16)}, \quad \frac{2xw-2x}{5w-16} \quad (\text{oe})$	4	M1 M1 (M1) (M1) M1 A1
19 (a)	$\frac{5 \times 7 \times 9 + 2 \times 6 \times 9 - 4 \times 6 \times 7}{6 \times 7 \times 9} \quad (\text{oe, no errors})$ $\frac{255}{378}, \quad \frac{85}{126}$ <p>NB: No working seen scores M0 A0</p>	2	M1 A1
(b)	$0.6746 \rightarrow 0.675$ NB: ft on 4 figure accuracy of their (a) giving their “3 sf answer”	1	B1 ft
(c)	6.75×10^{-1} (or better)	1	B1 ft

Question	Scheme	Mark	Notes
20 (a)	$1 - \frac{4}{t^2}$ (one term correct) $"1 - \frac{4}{t^2} = 0"$ (equating their f(t) to 0) $t = +2$ (cao) $\left("2" + \frac{4}{"2"}\right) - \left(8 + \frac{4}{8}\right)$ (oe) 4.5 (metres)	3 2	M1 M1 (DEP) A1 M1 A1
21 (a)	$x + y = 550$	1	B1
(b)	$22x + 12(y - 50) + (12 - 5) \times 50 = 8600$ (oe)	1	B1
(c)	$"22x + 12(550 - x - 50) + (12 - 5) \times 50 = 8600"$ (oe but complete method to solve SEs for x and y with no errors) NB: c's SEs in (a) and (b) must be linear SEs in x and y with (a) having unit coeffs. $x = 225$ $y = 325$	3	M1 A1 A1
22 (a)	$-12 < 4x$ OR $3x \leq 6$ (oe) $-3 < x$ $x \leq 2$ NB: $-3 < x \leq 2$ scores A2	3	M1 A1 A1
(b)	 Open circle at " $x = -3$ " and closed circle at " $x = 2$ " One single line joining the two circles	2	B1 ft B1 ft

Question	Scheme	Mark	Notes
23 (a)	One term correct	2	M1 A1
23 (b)	$9x^2 - 30x$ $9x^2 - 30x = -25$ $9x^2 - 30x + 25 = 0$ $(3x - 5)^2 \quad (\text{Attempt to factorise c's quadratic})$ $x = \frac{5}{3} \quad \text{OR} \quad 1\frac{2}{3} \quad \text{OR} \quad 1.67$	4	M1 A1 M1 A1
24 (a)	$\frac{6}{\sin \angle ABC} = \frac{10}{\sin 50} \quad \text{oe}$ $\angle ABC = \sin^{-1}\left(\frac{6 \times \sin 50}{10}\right)$	3	M1 M1 A1 (DEP)
24 (b)	$\frac{AB}{\sin(180 - (50 + \angle ABC))} = \frac{10}{\sin 50}$ $AB = \frac{10 \times \sin(180 - (50 + \angle ABC))}{\sin 50}$ <p>(OR</p> $AB^2 = 6^2 + 10^2 - 2 \times 6 \times 10 \times \cos(180 - (50 + \angle ABC))$ $AB = \sqrt{((6^2 + 10^2) - (2 \times 6 \times 10 \times \cos(180 - (50 + \angle ABC))))}$ <p>)</p> $AB = 12.74 \rightarrow 12.7 \text{ (cm) awrt}$	3	M1 M1 (M1) (M1 (DEP)) (DEP))

Question	Scheme	Mark	Notes
25 (a)	$\frac{1}{24} + \frac{1}{48} + \frac{1}{24x}$ of the tank filled in 1 hour, so $\frac{1}{24} + \frac{1}{48} + \frac{1}{24x}$ (oe) seen $\frac{3x+2}{48x}$ or $\frac{1}{16} + \frac{1}{24x}$ (isw after correct answer seen)	2	M1 A1
(b)	<p>) \therefore The 3 taps fill $\frac{3x+2}{48x} \times 15$ OR</p> $\left(\frac{1}{16} + \frac{1}{24x}\right) \times 15$	4	M1 M1 M1 A1
	<p>tanks of water in 15 hours</p> <p>So to fill in tank we must have</p> $\frac{3x+2}{2x} \times \frac{15}{24} = 1$ (tank)		(DEP) (DEP)
	$45x + 30 = 48x$ (removing denominators)		
	$\left(\text{OR } \frac{1}{16} + \frac{1}{24x} = \frac{1}{15}\right)$ (M1(DEP)) $24x = 240$ (M1(DEP))		
	$x = 10$		