

MATH PAPER ONE JET MARKING SCHEME

1	$\frac{0.08 \times 0.54 \times 20.25 \times 10^6}{0.81 \times 0.012 \times 10^6} = \frac{8 \times 54 \times 2025}{81 \times 12} = 90$	M1M1 A1									
2	L.C.M=12 $\frac{12}{2} + \frac{12}{3} + \frac{12}{4} = 6+4+3 = 13$ If 13 = 12 mins 182 = ? 182x12 / 13 = 2 hrs 48 mins Time = 10 : 48 a.m	M1 M1 A1 B1									
3	<table border="1"> <thead> <tr> <th>Men</th> <th>Hours</th> <th>Days</th> </tr> </thead> <tbody> <tr> <td>32</td> <td>9</td> <td>7</td> </tr> <tr> <td>?</td> <td>8</td> <td>6</td> </tr> </tbody> </table> $\frac{9}{8} \times \frac{7}{6} \times 32 = 42 \text{ men}$ Men needed = 42 - 32 = 10 men	Men	Hours	Days	32	9	7	?	8	6	M1 M1 A1 03
Men	Hours	Days									
32	9	7									
?	8	6									

4	point of intersection (2, -1)	L_1 L_1 B_1 03
5	Interior is x Exterior $\frac{1}{8}x$ $x + \frac{1}{8}x = 1\frac{1}{8}x$ $1\frac{1}{8}x = 180^\circ$ $x = 160^\circ$ exterior = 20° no of sides = $360^\circ / 20^\circ = 18$ sides	M1 M1 A1

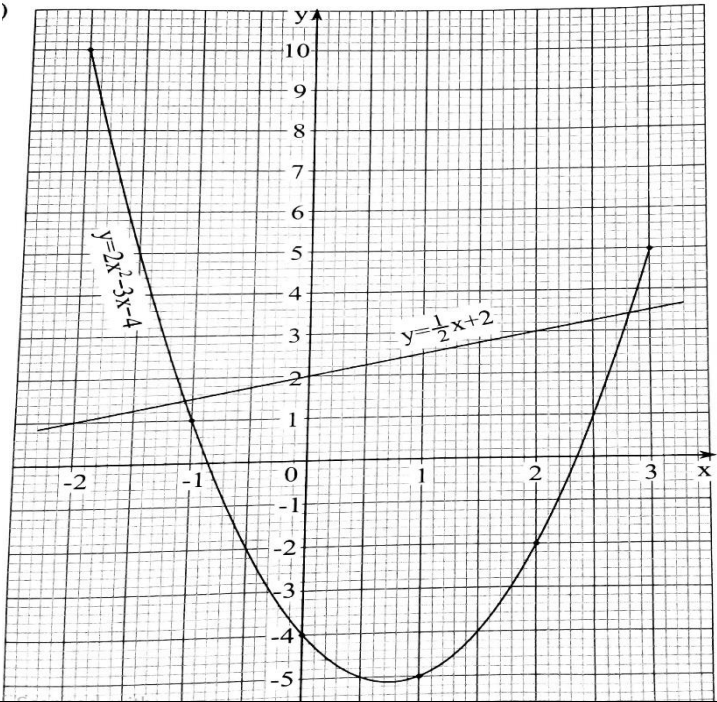
	$3 - -2$ $M2 = \frac{1}{2}$ $\text{Midpoint } \left\{ \frac{3 + -2}{2}, \frac{-6 + 4}{2} \right\} = \left\{ \frac{1}{2}, -1 \right\}$ $P(x, y) \cdot \frac{y - -1}{x - \frac{1}{2}} = \frac{1}{2}$ $Y + 1 = \frac{1}{2} \left(x - \frac{1}{2} \right)$ $Y = \frac{1}{2}x - 1\frac{1}{4} \text{ accept decimals}$	B1 M1 A1 03
10	$5 \begin{Bmatrix} 3 \\ 2 \end{Bmatrix} - 2 \begin{Bmatrix} 4 \\ 1 \end{Bmatrix} = \begin{Bmatrix} 15 \\ 10 \end{Bmatrix} - \begin{Bmatrix} 8 \\ 2 \end{Bmatrix} = \begin{Bmatrix} 7 \\ 8 \end{Bmatrix} - P$ $b \cdot \begin{Bmatrix} 7 \\ 8 \end{Bmatrix} \cdot \begin{Bmatrix} -6 \\ 8 \end{Bmatrix} = \begin{Bmatrix} -42 \\ 64 \end{Bmatrix}$	M1A1 A1 03
11	$K(K+7) - 4(-3) = 0$ $K^2 + 7K + 12 = 0$ $(K+3)(K+4) = 0$ $K = -3 \text{ OR } -4$ $\begin{Bmatrix} 4 & 4 \\ -3 & -3 \end{Bmatrix} \quad \text{OR} \quad \begin{Bmatrix} 3 & 4 \\ -3 & -4 \end{Bmatrix}$	M1 A1 B1 for both
12	$\frac{22}{7} \times 5^2 (10 - 6) = 314.29 \text{ cm}^3$ $\frac{4}{3} \times \frac{22}{7} r^3 = 314.29$	M1 M1 A1

	$r = 4.217$	03
13	$\frac{(y-2x)(2y+x)}{(2y-x)(2y+x)}$ $\frac{y-2x}{2y-x}$	M1 M1 A1 03
14	3- sum of digits divisible by 3 4-the last two digits divisible by 4 120 } 744 } 9564 } 192 } 36	B1 B1 B1 03
15	a. Mode -15 years b. Mean $13+13+13+14+14+14+15+15+15+15+16+16+16+17+18 = 224/15 = 14.93$ Median 13,13,13,14,14,14,15,15,15,15,16,16,16,17,18 =15 15-14.93 = 0.07	B1 B1 B1 B1 04
16	$\left(\frac{5}{3}\right)^{7k-5} = \left(\frac{9}{25}\right)^{k-1}$ $\frac{5^{7k-5}}{3^{7k-5}} = \frac{3^{2k-2}}{5^{2k-2}}$ $\frac{5^{7k-5}}{3^{7k-5}} = \frac{5^{-2k+2}}{3^{-2k+2}}$ $7k-5 = -2k+2$ $K = \frac{7}{9}$	M1 M1 A1 03

(a)

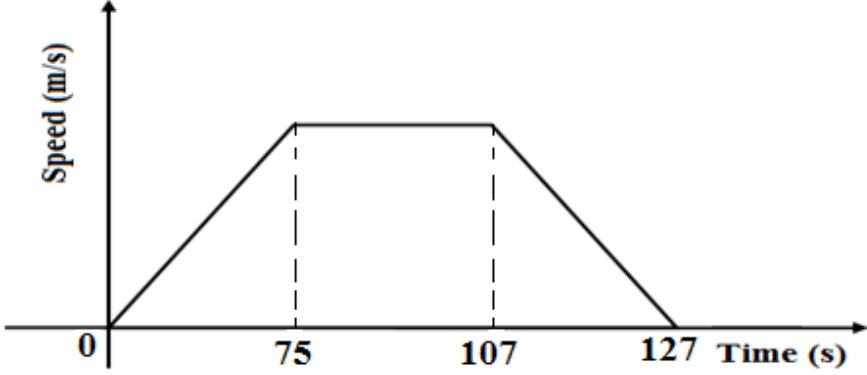
x	-2	-1	0	1	2	3
$2x^2$	8	2	0	2	8	18
$-3x$ -4	2	-1	-4	-7	-10	-13
y	10	1	-4	-5	-2	5

(b)

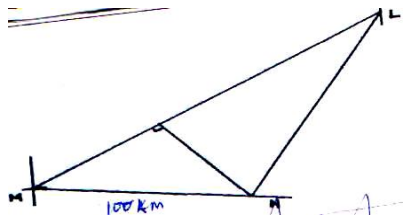
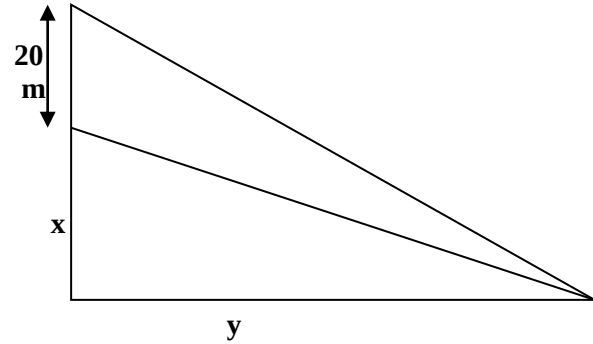


B1B1

S1
P1
C1

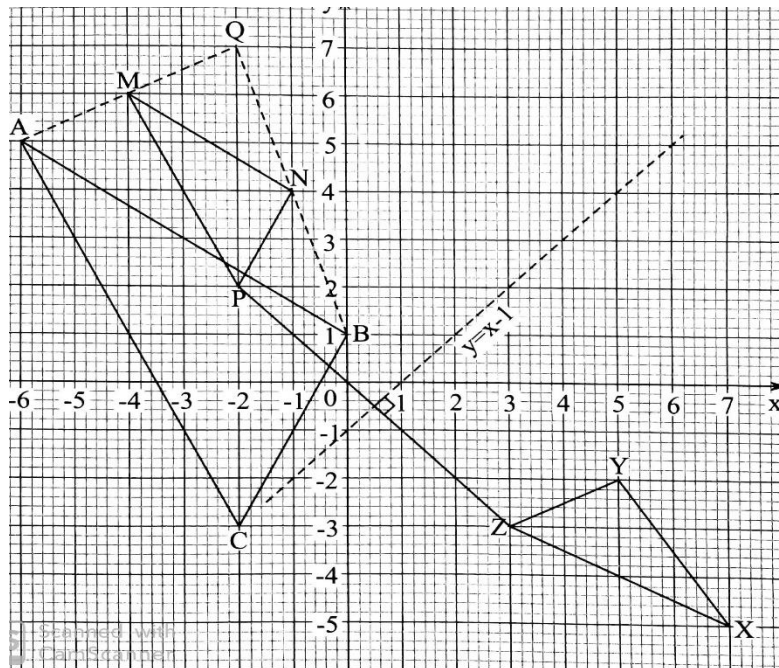
	(c) $x = -0.85, x = 2.35$ (d) $4x^2 - 7x = 12$ $2x^2 - \frac{7}{2}x - 6 = 0$ $y = \frac{2x^2 - 3x - 4}{\frac{1}{2}x + 2}$ $x = -1.1, x = 2.8$	B1B1 B1B1 B1 10
18	 (a) <i>Total distance = Area under the graph</i> $= \frac{1}{2}(127 + 32)v = 2385$ $= \frac{159}{2}v = 2385$ $v = 30\text{m/s}$ $\text{speed in km/hr} = 30 \times \frac{3600}{1000}$ $= 108\text{km/hr}$	M1 A1

	(b) <i>Acceleration</i> $= \frac{30-0}{75-0}$ $= 0.4m/s^2$ (c) <i>uniform deceleration</i> $= \frac{0-30}{127-107}$ $= -1.5m/s^2$ <i>speed at the start of the last 15 seconds</i> $= 30 + (-1.5 \times 5) = 22.5m/s$ <i>Distance covered</i> $= \frac{1}{2} \times 15 \times 22.5$ $= 168.75m$ (d) $\frac{3}{5} \times 2385 = 1431m$ $\left(\frac{1}{2} \times 75 \times 30\right) + 30x = 1431$ $x = 10.2s$ Time $= 75+10.2 = 85.2s$	M1 A1 M1 M1 A1 M1 M1 A1 10
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19	 (ii) $4.4 \times 50 = 220\text{km} \pm 5$ (iii) $8.5 \times 50 = 425 \pm 5$ (iv) 200°	B1 B1 B1 B1B1B1 B1B1 B1B1 10
20	a.  $\tan 33^\circ = \frac{x}{y}$ $y = \frac{x}{\tan 33}$ $\tan 40^\circ = \frac{x+20}{y}$	B1 M1 M1

	$y = \frac{x+20}{\tan 40}$ $\cdot \frac{x}{\tan 33} = \frac{x+20}{\tan 40}$ $X \tan 40 = \tan 33 (x+20)$ $X = 68.5 \text{ m}$ b. The shortest distance $\sin 40 = \frac{88.5}{z}$ $Z = 105.5 \text{ m}$	M1 M1 A1 M1M1M1 A1
21	(a) $DC = \sqrt{3^2 + 5^2}$ $= \sqrt{34}$ $= 5.8 \text{ cm}$ (b) $\tan \alpha = \frac{5}{6} = 1.667$ $\alpha = \tan^{-1} (1.677)$ $\angle ADC = 59.0^\circ$ (c) $c^2 = a^2 + b^2 - 2ab \cos \emptyset$ $\cos \emptyset = \frac{8^2 + 5^2 - 11^2}{2 \times 8 \times 5}$ $\cos \emptyset = -0.4$ $\emptyset = \cos^{-1}(-0.4)$	M1 A1 M1 A1 M1 M1 A1

	$\angle ACB = 113.6^\circ$ (d) Area of ABCD = $\left(\frac{1}{2} \times 3 \times 5\right) + \left(\frac{1}{2} \times 5 \times 8 \times \sin 113.6\right)$ $= 7.5 + 18.3$ $= 25.8 \text{ cm}^2$	M1M1 A1 10
22	(a) Q(-2,7) - (centre of enlargement) Scale factor = $\frac{1}{2}$ (b) $y = x - 1$ (c) ASF = (LSF) ² $2^2 = 4$	B1B1B1 M1A1 B1 B1 B1



Area of triangle ABC = $4Q\text{cm}^2$

M1
A1
10

23

X	2	3	4	5	6	7	8
Y	3	5	9	15	23	33	45

$$A = \frac{1}{2} \left\{ (3+45) + 2(5+9+15+23+33) \right\}$$

A = 109 Sq. units

$$c. \left[\frac{x^3}{3} - \frac{3x^2}{2} + 5x \right]_2^8$$

$$\left(\frac{8^3}{3} - \frac{3(8)^2}{2} + 5(8) \right) - \left(\frac{2^3}{3} - \frac{3(2)^2}{2} + 5(2) \right)$$

B1B1

M1M1
A1

M1

M1

	$\frac{344}{3} - \frac{20}{3} = \frac{324}{3} = 108 \text{ sq. units}$ d. $\frac{1}{108} \times 100 = 0.9259 \%$	A1 M1A1
24	(a) $S = (4)^3 - 5(4)^2 + 4(4) + 3$ $= 3\text{m}$ (b) $v = \frac{dS}{dt} = 3t^2 - 10t + 4$ $= 3(4)^2 - 10(4) + 4$ $= 12\text{m/s}$ (c) $3t^2 - 10t + 4 = 0$ $t = \frac{10 \pm \sqrt{100 - 48}}{6}$ $t = 2.87 \text{ and } t = 0.46$ (d) $a = \frac{dv}{dt} = 6t - 10$ $= 6(3) - 10 = 8\text{m/s}^2$	M1 A1 M1 M1 A1 M1 M1 A1 M1 A1 10