

INDIAN SCHOOL MUSCAT

FIRST PRE-BOARD EXAMINATION

FEBRUARY 2021

SET A

CLASS XII

Marking Scheme – MATHEMATICS [THEORY]

Q.NO.	Answers	Marks (with split up)
1.	$\frac{\pi}{3}$ (OR) $\frac{\pi}{4} - \frac{x}{2}$	1
2.	$ A = 10$	1
3.	$ \vec{b} = 3$	1
4.	$x + y = 0$	1
5.	$\frac{e^{\sin\sqrt{x}} \cdot \cos\sqrt{x}}{2\sqrt{x}}$	1
6.	$a = -3, b = 0, c = -2$ (OR) $x = 8, y = 8$	1
7.	$\frac{dy}{dx} = \frac{-2x}{1-x^4}$	1
8.	$Q = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$	1
9.	1	1
10.	110	1
11.	$\frac{-\cos^4 x}{4} + c$	1
12.	$C = 5$	1
13.	0	1
14.	$\frac{1}{2}$ (OR) 8	1
15.	0	1
16.	$\frac{1}{6}$	1
17.	(i) (C) $f(x)$ is continuous at all points in its domain (ii) (B) 0 (iii) (D) $f(x)$ is not differentiable at $x = 5$ and $x = 10$ (iv) (A) -2 (v) (C) 0	1+1+1+1
18.	(i) (C) $\vec{r} = (\hat{i} + 2\hat{j} + \hat{k}) + \lambda(\hat{i} - \hat{j} + \hat{k})$ (ii) (D) $-3\hat{i} + 3\hat{k}$ (iii) (D) $\frac{x-2}{2} = \frac{y+1}{1} = \frac{z+1}{2}$ (iv) (C) $\frac{1}{\sqrt{3}}, -\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}$ (v) (B) $\frac{3\sqrt{2}}{2}$	1+1+1+1
19.	Any suitable example	

20.	<p>Let $x = \cos\theta$</p> $\begin{aligned} & \therefore \cos[2 \cot^{-1} \frac{\sqrt{1-\cos\theta}}{\sqrt{1+\cos\theta}}] + \cos\theta \\ &= \cos[2 \cot^{-1} \left(\frac{\sin \frac{\theta}{2}}{\cos \frac{\theta}{2}} \right)] + \cos\theta \\ &= \cos[2 \cot^{-1} \{ \cot(\frac{\pi}{2} - \frac{\theta}{2}) \}] + \cos\theta \\ &= \cos[2(\frac{\pi}{2} - \frac{\theta}{2})] + \cos\theta \\ &= \cos(\pi - \theta) + \cos\theta = 0 \end{aligned}$	$\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk
21.	<p>dr's of the normal are $1+2, -3+1, 3+3 = 3, -2, 6$ Eq of plane is $3(x-1)-2(y+3)+6(z-3) = 0$ (it passes through $1, -3, 3$) $= 3x-2y+6z-27 = 0$</p>	$\frac{1}{2}$ mk 1 mk $\frac{1}{2}$ mk
22.	$\vec{a} + \vec{b} = 2\hat{i} + 3\hat{j} + 4\hat{k}, \vec{a} - \vec{b} = -\hat{j} - 2\hat{k}$ $(\vec{a} + \vec{b}) \cdot (\vec{a} - \vec{b}) = -2\hat{i} + 4\hat{j} - 2\hat{k}$ Unit vector $= \frac{-2\hat{i} + 4\hat{j} - 2\hat{k}}{2\sqrt{6}}$ Vector of magnitude 9 $= \frac{9}{\sqrt{6}} (-\hat{i} + 2\hat{j} - \hat{k})$ (OR) Given, $\hat{a} + \hat{b} = 1, \hat{a} = 1, \hat{b} = 1$ $\Rightarrow \hat{a} + \hat{b} ^2 + \hat{a} - \hat{b} ^2 = 2 [\hat{a} ^2 + \hat{b} ^2]$ $\Rightarrow 1 + \hat{a} - \hat{b} ^2 = 2(2)$ $\Rightarrow \hat{a} - \hat{b} ^2 = 3$ $\Rightarrow \hat{a} - \hat{b} = \sqrt{3}$	$\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk 1 mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk
23.	$xy = \log y + c$ $\Rightarrow x \cdot \frac{dy}{dx} + y = \frac{1}{y} \cdot \frac{dy}{dx}$ $\Rightarrow \frac{dy}{dx} \left(x - \frac{1}{y} \right) = -y$ $\Rightarrow \frac{dy}{dx} = \frac{-y^2}{xy-1} = \frac{y^2}{1-xy}$	1 mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk
24.	$\begin{aligned} & \int \frac{(x+6)}{(x+9)^4} e^x dx = \int \left(\frac{(x+9)-3}{(x+9)^4} \right) e^x dx \\ &= \int \left[\frac{1}{(x+9)^3} - \frac{3}{(x+9)^4} \right] e^x dx = \frac{e^x}{(x+9)^3} + c \end{aligned}$ <p>(OR)</p> $\begin{aligned} I &= \int_0^{\frac{\pi}{2}} \frac{2 \sin x}{2 \sin x + 2 \cos x} dx \rightarrow (1) \\ I &= \int_0^{\frac{\pi}{2}} \frac{2 \cos x}{2 \cos x + 2 \sin x} dx \rightarrow (2) \quad [\text{applying } \int_0^a f(x) dx = \int_0^a f(a-x) dx] \\ (1) + (2) \rightarrow 2I &= \int_0^{\frac{\pi}{2}} 1 dx = [x]_0^{\frac{\pi}{2}} \\ \rightarrow I &= \frac{\pi}{4} \end{aligned}$	1 mk 1 mk 1 mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk

25.	X : no. of oranges drawn $\rightarrow x = 0, 1, 2$ $P(X=0) = \frac{4C_1}{7C_2} = \frac{2}{7}$ $P(X=1) = \frac{4C_1 \cdot 3C_1}{7C_2} = \frac{4}{7}$ $P(X=2) = \frac{3C_2}{7C_2} = \frac{1}{7}$	$\frac{1}{2}$ mk 1 mk $\frac{1}{2}$ mk
26.	$y = x + \frac{1}{x}$ $\frac{dy}{dx} = 1 - \frac{1}{x^2} \rightarrow (1)$ Slope of the given line is $\frac{3}{4} \rightarrow (2)$ $(1) = (2) \rightarrow 1 - \frac{1}{x^2} = \frac{3}{4}$ $\rightarrow \frac{1}{x^2} = \frac{1}{4} \rightarrow x^2 = 4 \rightarrow x = 2$ (given that $x > 0$) \Rightarrow Eqn of normal $\rightarrow y - \frac{5}{2} = -\frac{4}{3}(x-2)$ $\Rightarrow 8x + 6y - 31 = 0$	Getting (1) & (2) $\left\{ \frac{1}{2} \text{mk} \right.$ Finding x & slope 1 mk $\frac{1}{2}$ mk
27.	$x = ae^t(\sin t + \cos t) \rightarrow \frac{dx}{dt} = a[e^t(\cos t - \sin t) + (\sin t + \cos t)e^t]$ $\Rightarrow \frac{dx}{dt} = 2ae^t \cos t$ $y = ae^t(\sin t - \cos t) \rightarrow \frac{dy}{dt} = a[e^t(\cos t + \sin t) + (\sin t - \cos t)e^t]$ $\Rightarrow \frac{dy}{dt} = 2ae^t \sin t$ $\frac{dy}{dx} = \tan t = \frac{ae^t(\sin t + \cos t + \sin t - \cos t)}{ae^t(\sin t + \cos t - \sin t + \cos t)} = \frac{x+y}{x-y}$ (OR) $y = \tan^{-1}\left(\frac{a}{x}\right) + \frac{1}{2}[\log(x-a) - \log(x+a)]$ $\Rightarrow \frac{dy}{dx} = \frac{1}{1+\frac{a^2}{x^2}}\left(-\frac{a}{x^2}\right) + \frac{1}{2}\left[\frac{1}{x-a} - \frac{1}{x+a}\right]$ $= -\frac{a}{x^2+a^2} + \frac{a}{x^2-a^2}$ $= \frac{2a^3}{x^4-a^4}$	$\frac{1}{2}$ mk $\frac{1}{2}$ mk 1 mk
28.	$f(x) = 12x^{4/3} - 6x^{1/3}$ $\Rightarrow f'(x) = 16x^{1/3} - \frac{2}{x^{2/3}}$ $\Rightarrow f'(x) = 0 \Rightarrow 16x = 2 \Rightarrow x = \frac{1}{8}$ $\Rightarrow f(1/8) = 12(1/8)^{4/3} - 6(1/8)^{1/3} = 12 \times \frac{1}{16} - 6 \times \frac{1}{2} = -\frac{9}{4}$ $\Rightarrow f(-1) = 12(-1)^{4/3} - 6(-1)^{1/3} = 12 + 6 = 18$	$\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk

	<p>$\Rightarrow f(1) = 12(1)^{4/3} - 6(1)^{1/3} = 12 - 6 = 6$ \Rightarrow Absolute max value = 18 & Absolute min value = $-\frac{9}{4}$</p>	$\frac{1}{2}$ mk
29.	<p>For one-one : Let $x_1, x_2 \in [0, \infty)$. $f(x_1) = f(x_2) \Rightarrow \frac{2x_1}{2x_1+1} = \frac{2x_2}{2x_2+1}$ $\Rightarrow x_1 - x_2 = 0 \Rightarrow x_1 = x_2 \Rightarrow f$ is one-one.</p> <p>For onto : Let $y = \frac{2x}{2x+1}$ for $y \in [0, \infty)$ $\Rightarrow x = \frac{y}{2-2y}, y \neq 1$ Clearly for $y = 1 \in [0, \infty)$, there does not exist any $x \in [0, \infty)$ $\therefore f$ is not onto</p>	1 $\frac{1}{2}$ mk 1 $\frac{1}{2}$ mk
30.	$AB = \begin{bmatrix} 2 & 3 \\ 1 & -4 \end{bmatrix} \begin{bmatrix} 1 & -2 \\ -1 & 3 \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 5 & -14 \end{bmatrix}$ $\Rightarrow adj(AB) = \begin{bmatrix} -14 & -5 \\ -5 & -1 \end{bmatrix} \rightarrow (1)$ $\Rightarrow adj A = \begin{bmatrix} 4 & 3 \\ 1 & -2 \end{bmatrix}$ & $adj B = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$ \Rightarrow Now, $(adj A)(adj B) = \begin{bmatrix} -15 & -11 \\ -1 & 0 \end{bmatrix} \rightarrow (2)$ From (1) & (2), we get $adj AB \neq (adj A)(adj B)$ (OR) $A = \begin{vmatrix} a & b \\ c & \frac{1+bc}{a} \end{vmatrix} \Rightarrow B = 1 \rightarrow$ $\therefore Adj B = \begin{bmatrix} 3 & 1 & 2 \\ 2 & 1 & 2 \\ 6 & 2 & 5 \end{bmatrix}^T = \begin{bmatrix} 3 & 2 & 6 \\ 1 & 1 & 2 \\ 2 & 2 & 5 \end{bmatrix} \rightarrow$ $B^{-1} = \frac{1}{3} \begin{bmatrix} 3 & 2 & 6 \\ 1 & 1 & 2 \\ 2 & 2 & 5 \end{bmatrix} \rightarrow$ Now, $(AB)^{-1} = B^{-1}A^{-1} = \frac{1}{3} \begin{bmatrix} 3 & 2 & 6 \\ 1 & 1 & 2 \\ 2 & 2 & 5 \end{bmatrix} \cdot \begin{bmatrix} 3 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix} = \begin{bmatrix} 9 & -3 & 5 \\ -2 & 1 & 0 \\ 1 & 0 & 2 \end{bmatrix}$	Getting (1) 1 $\frac{1}{2}$ mk Getting (2) 1 $\frac{1}{2}$ mk $\frac{1}{2}$ mk 1 mk $\frac{1}{2}$ mk 1 mk
31.	Eq. of the line $\rightarrow \frac{x-2}{3} = \frac{y+4}{4} = \frac{z-2}{2} = \lambda \rightarrow$ \rightarrow General point $P = (3\lambda + 2, 4\lambda - 4, 2\lambda + 2) \rightarrow$ $\rightarrow P$ lies on the plane $\Rightarrow (3\lambda + 2) - 2(4\lambda - 4) + (2\lambda + 2) = 0$ $\Rightarrow \lambda = 4 \rightarrow$ $\therefore P = (14, 12, 10)$ & distance $AP = 13 \rightarrow$	$\frac{1}{2}$ mk $\frac{1}{2}$ mk (Finding λ) 1 mk $\frac{1}{2} + \frac{1}{2}$
32.	$I = \int \frac{(x+1)}{(x+3)(x^2+4)} dx = \frac{A}{x+3} + \frac{Bx+C}{x^2+4} \rightarrow$	$\frac{1}{2}$ mk

	Solving for A, B, C, we get $A = -\frac{2}{13}$, $B = \frac{2}{13}$, $C = \frac{7}{13}$ \rightarrow $\therefore I = -\frac{2}{13} \int \frac{1}{x+3} dx + \frac{2}{13} \int \frac{x}{x^2+4} dx + \frac{7}{13} \int \frac{1}{x^2+4} dx$ $= -\frac{2}{13} \log x+3 + \frac{1}{13} \log(x^2+4) + \frac{7}{26} \tan^{-1} \frac{x}{2} + C$	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} \text{ mk}$ $\frac{1}{2} \text{ mk}$
33.	$(x^2 + 1) \frac{dy}{dx} + 2xy = \sqrt{x^2 + 4}$ $\rightarrow \frac{dy}{dx} + \frac{2x}{x^2+1}y = \frac{\sqrt{x^2+4}}{x^2+1}$ \rightarrow $\rightarrow I.F = e^{\int \frac{2x}{x^2+1} dx} = e^{\log(x^2+1)} = x^2 + 1$ \rightarrow $\therefore y(x^2 + 1) = \int \frac{\sqrt{x^2+4}}{x^2+1} (x^2 + 1) dx$ \rightarrow $\rightarrow y(x^2 + 1) = \frac{x}{2} \sqrt{x^2 + 4} + 2 \log x + \sqrt{x^2 + 4} + C$ \rightarrow (OR) $x \left(\frac{dy}{dx} \right) = y - x \operatorname{cosec} \left(\frac{y}{x} \right) \rightarrow \frac{dy}{dx} = \frac{y}{x} - \operatorname{cosec} \left(\frac{y}{x} \right)$ Put $\frac{y}{x} = V \Rightarrow \frac{dy}{dx} = V + x \frac{dv}{dx}$ $\rightarrow \frac{dv}{\operatorname{cosec} v} = -\frac{dx}{x} \rightarrow \int \sin v dv = -\int \frac{dx}{x}$ $\rightarrow -\cos \left(\frac{y}{x} \right) = -\log x + C$ When $y = 0, x = 1 \rightarrow C = -1$ $\therefore \cos \left(\frac{y}{x} \right) = 1 + \log x $	Reducing to standard form- $\frac{1}{2}$ mk 1 mk 1 mk $\frac{1}{2} \text{ mk}$ $\frac{1}{2} \text{ mk}$ $\frac{1}{2} + \frac{1}{2} \text{ mk}$
34.	Let $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}_{2 \times 2}$ $\therefore \begin{pmatrix} 2 & -1 \\ 1 & 0 \\ -3 & 4 \end{pmatrix} \begin{pmatrix} a & b \\ c & d \end{pmatrix} = \begin{pmatrix} -1 & -8 \\ 1 & -2 \\ 9 & 22 \end{pmatrix}$ Solving to get $a = 1, b = -2, c = 3, d = 4$ $\therefore A = \begin{pmatrix} 1 & -2 \\ 3 & 4 \end{pmatrix}$	$\frac{1}{2} \text{ mk}$ 2 mks $\frac{1}{2} \text{ mk}$
35.	Figure with shaded region Solving $y = \frac{x^2}{4}$ and $y = \frac{1}{4}(x+2)$, we get $x = -1, \& 2$. Req. area = $\int_{-1}^2 \frac{x+2}{4} - \frac{1}{4} \int_{-1}^2 x^2 dx$ $= \frac{9}{8} \text{ sq. units}$	1 mk $\frac{1}{2} \text{ mk}$ 1 mk $\frac{1}{2} \text{ mk}$
36.	Given: $V = \frac{1}{3} \pi r^2 h \Rightarrow h = \frac{3V}{\pi r^2}$ $S = (\pi r l)^2 = \pi^2 r^2 (r^2 + h^2) = \pi^2 r^2 \left(r^2 + \frac{9V^2}{\pi^2 r^4} \right)$ $\Rightarrow S = \pi^2 r^4 + \frac{9V^2}{r^2} \Rightarrow \frac{dS}{dr} = 4\pi^2 r^3 - \frac{18V^2}{r^3}$ For least CSA, $\frac{dS}{dr} = 0 \Rightarrow 3V = \sqrt{2} \pi r^3$	$\frac{1}{2} \text{ mk}$ 1 mk 1 mk $\frac{1}{2} \text{ mk}$

	<p>Now, $h = \frac{3V}{\pi r^2} = \frac{\sqrt{2}\pi r^3}{\pi r^2} = \sqrt{2}r \Rightarrow \frac{h}{r} = \sqrt{2} \Rightarrow \cot \theta = \sqrt{2}$ Also, $\frac{d^2S}{dr^2} = 12\pi^2 r^2 + \frac{54V^2}{r^4} > 0 \rightarrow$ CSA is least when $h = \sqrt{2}r$. (OR)</p> <p>Given: $h + 2\pi r = K$ (constant) $\rightarrow h = K - 2\pi r$ $V = \pi r^2 h = \pi(Kr^2 - 2\pi r^3)$ Now, $\frac{dV}{dr} = \pi(2Kr - 6\pi r^2)$ For max volume, $\frac{dV}{dr} = 0 \Rightarrow 2r(3\pi r - K) = 0 \Rightarrow r = 0, r = \frac{K}{3\pi}$ $\therefore h = K - 2\pi r = 3\pi r - 2\pi r = \pi r \Rightarrow \frac{h}{r} = \pi$ Also, $\frac{d^2V}{dr^2} = \pi(2K - 12\pi r) < 0 \rightarrow$ Vol is max when $K = 3\pi r$ Max vol = $\pi \left(\frac{K}{3\pi}\right)^2 (\pi r) = \frac{K^3}{27\pi}$</p>	1 mk 1 mk ½ mk 1 ½ mk 1 mk ½ mk ½ mk 1 mk
37.	<p>E_1: cars rented from agency L $\rightarrow P(E_1) = \frac{50}{100}$ E_2: cars rented from agency M $\rightarrow P(E_2) = \frac{30}{100}$ E_3: cars rented from agency N $\rightarrow P(E_3) = \frac{20}{100}$ A: cars are in good condition. $P(A/E_1) = \frac{90}{100}, P(A/E_2) = \frac{70}{100}, P(A/E_3) = \frac{60}{100}$ (i) $P(A) = P(E_1).P(A/E_1) + P(E_2).P(A/E_2) + P(E_3).P(A/E_3) = \frac{39}{50}$ (ii) $P(E_3/A) = \frac{P(E_3).P(A/E_3)}{P(A)} = \frac{1}{6}$ (OR)</p> <p>E_1: doctor comes by train $\rightarrow P(E_1) = \frac{1}{10}$ E_2: doctor comes by bus $\rightarrow P(E_2) = \frac{1}{5}$ E_3: doctor comes by scooter $\rightarrow P(E_3) = \frac{3}{10}$ E_4: doctor comes by taxi $\rightarrow P(E_4) = \frac{2}{5}$ A: the doctor comes late $P(A/E_1) = \frac{1}{4}, P(A/E_2) = \frac{1}{3}, P(A/E_3) = \frac{1}{12}, P(A/E_4) = 0$ (i) $P(E_2/A) = \frac{P(E_2).P(A/E_2)}{P(E_1).P(A/E_1) + P(E_2).P(A/E_2) + P(E_3).P(A/E_3)} = \frac{4}{7}$ (ii) $P(E_1/A) = \frac{P(E_1).P(A/E_1)}{P(A)} = \frac{3}{14}$</p>	½ + ½ + ½ 1 mk 1 mks 1 ½ mk 1 mk 1 mks 1 mk
38.	<p>Maximise: $Z = 50x + 60y$ 3 lines correctly drawn with the feasible region Finding the corner points Max value = 500 at (10, 0) (OR)</p>	3 ½ mks 2 mks ½ mk

	<p><i>Minimise:</i> $Z = 7x + 10y$ 3 lines correctly drawn with the feasible region Finding the corner points Min value = 70 at (10, 0)</p>	Same as above
	SET – B	
1.	$P(B/A) = \frac{P(B \cap A)}{P(A)} \Rightarrow 0.6 = \frac{P(B \cap A)}{0.4} \Rightarrow P(B \cap A) = 0.24$ $\text{Now, } P(A/B) = \frac{0.24}{0.8} = 0.3$	(1)
8.	Dr's of the normal are 2, -1, 2 \rightarrow dc's are $\frac{2}{3}, -\frac{1}{3}, \frac{2}{3}$ \therefore Foot of the $\perp = \left(\frac{14}{3}, -\frac{7}{3}, \frac{14}{3}\right)$	(1)
14.	$2\vec{a} = 8\hat{i} + 6\hat{j} + 4\hat{k}$, $ \vec{b} \times 2\vec{a} = -12\hat{i} + 4\hat{j} + 18\hat{k} = \sqrt{484} = 22$	(1)
19.	$f'(x) = \cos x - \sin x \Rightarrow f'(x) = 0 \Rightarrow x = \frac{\pi}{4}$ $\Rightarrow f(0) = 1, f\left(\frac{\pi}{4}\right) = \sqrt{2}, f(\pi) = -1$ \Rightarrow Abs. max value = $\sqrt{2}$ & Abs. min value = -1	$\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2} + \frac{1}{2}$
23.	X : getting doublet in a single throw of a pair of dice $\rightarrow X = 0, 1, 2$ $P(X = 0) = \frac{5}{6} \times \frac{5}{6} = \frac{25}{36}$ $P(X = 1) = \frac{1}{6} \times \frac{5}{6} + \frac{5}{6} \times \frac{1}{6} = \frac{10}{36}$ $P(X = 2) = \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$	$\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk
25.	$y = e^{m \sin^{-1} x} \Rightarrow \frac{dy}{dx} = e^{m \sin^{-1} x} \cdot \frac{m}{\sqrt{1-x^2}}$ $\Rightarrow \sqrt{1-x^2} \frac{dy}{dx} = m e^{m \sin^{-1} x}$ Diff again, $\sqrt{1-x^2} \frac{d^2y}{dx^2} + \frac{dy}{dx} \cdot \frac{-2x}{2\sqrt{1-x^2}} = m^2 \frac{e^{m \sin^{-1} x}}{\sqrt{1-x^2}}$ Solving to get $(1-x^2) \frac{d^2y}{dx^2} - x \frac{dy}{dx} = m^2 y$	$\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk
29.	Solving $3x^2 = 4y$ and $3x = 2y - 12$, we get $x = -2$ & $x = 4$ \therefore Req. area = $\int_{-2}^4 \left[\left(\frac{3}{2}x + 6 \right) dx - \left(\frac{3x^2}{4} \right) dx \right]$ $\Rightarrow \frac{3}{2} \int_{-2}^4 x dx + 6 \int_{-2}^4 dx - \frac{3}{4} \int_{-2}^4 x^2 dx$ $\Rightarrow 27$ sq. units	$\frac{1}{2}$ mk 1 mk 1 mk $\frac{1}{2}$ mk
32.	$\begin{aligned} \int_2^5 [x-2 + x-3 + x-5] dx &= \int_2^3 -(x-6) dx + \int_3^5 x dx \\ &= \frac{23}{2} \end{aligned}$	2 $\frac{1}{2}$ mks $\frac{1}{2}$ mk

