

SET	A/B/C
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**INDIAN SCHOOL MUSCAT
HALF YEARLY EXAMINATION 2022
MATHEMATICS (041)**

CLASS: XII

Max.Marks: 80

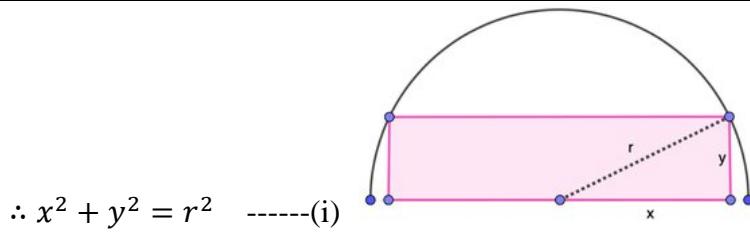
MARKING SCHEME			
SET A	QN.NO	VALUE POINTS	MARKS SPLIT UP
	1.	(c) (2, 4)	(1)
	2.	(a) $-2\cos \sqrt{x} + C$	(1)
	3.	(b) -3	(1)
	4.	(c) 8	(1)
	5.	(a) 0	(1)
	6.	(b) $\sin x - \cos x + C$	(1)
	7.	(a) I	(1)
	8.	(d) 1	(1)
	9.	(c) $\frac{1}{2\sqrt{\pi}}$ units	(1)
	10.	(a) $-\frac{1}{3} \cos x^3 + C$	(1)
	11.	Local minima	(1)
	12.	$\frac{x^8}{8} + C$	(1)
	13.	1	(1)
	14.	Skew-symmetric	(1)
	15.	False	(1)
	16.	True	(1)
	17.	False	(1)

	18.	True	(1)
	19.	Any relevant answer	(1)
	20.	$-\frac{\pi}{3}$	(1)
	21.	<p>(i) As $(2, 4) \in R$ but $(4, 2) \notin R \Rightarrow R$ is not symmetric.</p> <p>(ii) Let (a, b) and $(b, c) \in R$ $\Rightarrow b = ka$ and $c = pb$ Now, $c = pb = p(ka) \Rightarrow (a, c) \in R \therefore R$ is transitive. (OR)</p> <p>Reflexive: Let $a = \frac{1}{2}$, so $\frac{1}{2} \not< \left(\frac{1}{2}\right)^2 \therefore$ not reflexive.</p> <p>Symmetric: Let $a = -1, b = 2$, so $(-1) < (2)^2$ but $2 \not< (-1)^2 \therefore$ not symmetric.</p> <p>Transitive: Let $a = 6, b = 3, c = 2$ So, $6 < (3)^2, 3 < (2)^2$ but $6 \not< (2)^2 \therefore$ not transitive.</p>	1 mk 1 mk ½ mk ½ mk 1 mk
	22.	$f(x) = \tan^{-1}\left(\frac{1+\cos x}{\sin x}\right) = \tan^{-1}\left(\frac{2\cos^2 \frac{x}{2}}{2\sin \frac{x}{2}\cos \frac{x}{2}}\right)$ $= \tan^{-1}\left(\cot \frac{x}{2}\right) = \tan^{-1}\left[\tan\left(\frac{\pi}{2} - \frac{x}{2}\right)\right]$ $f(x) = \frac{\pi}{2} - \frac{x}{2}$ $\therefore f'(x) = -\frac{1}{2}$ (OR) <p>Let $u = x^{\log x}$ and $v = \log x$ Now, $\log u = (\log x)^2$ Getting $\frac{du}{dx} = \frac{2 \log x}{x} \cdot x^{\log x}$ And $\frac{dv}{dx} = \frac{1}{x}$ $\therefore \frac{du}{dv} = 2 \log x \cdot x^{\log x}$</p>	½ mk ½ mk ½ mk ½ mk 1 mk ½ mk ½ mk
	23.	$\int \frac{1}{(1-x)(2-x)} dx = \int \frac{1}{(1-t)(2-t)} dt$ Simplifying to get: $\int \frac{1}{1-t} dt - \int \frac{1}{2-t} dt$ Final answer: $\log \left \frac{2-x}{1-x} \right + C$ (OR) $\int \frac{(2x-5)e^{2x}}{(2x-3)^3} dx = \frac{1}{2} \int \frac{(t-5)}{(t-3)^3} e^t dt = \frac{1}{2} \int \frac{(t-3-2)}{(t-3)^3} e^t dt \quad \text{taking } 2x = t$ $= \frac{1}{2} \int \left[\frac{1}{(t-3)^2} - \frac{2}{(t-3)^3} \right] e^t dt$ $= \frac{1}{2} \frac{1}{(t-3)^2} e^t + C = \frac{1}{2} \frac{1}{(2x-3)^2} e^{2x} + C$	½ mk 1 mk ½ mk ½ mk ½ mk ½ mk ½ mk ½ + ½ mk
	24.	For one-one: Let $f(x_1) = f(x_2)$, then $\frac{4x_1+3}{6x_1-4} = \frac{4x_2+3}{6x_2-4}$ Getting $(4x_1+3)(6x_2-4) = (4x_2+3)(6x_1-4)$ Simplifying to get $-16x_1 + 18x_2 = 18x_1 - 16x_2$ Solving to get $x_1 = x_2$ or f is one-one.	½ mk ½ mk ½ mk ½ mk
	25.	$\int \sec^4 x \tan x dx = \int \sec^3 x \cdot (\sec x \tan x) dx$	½ mk

	$= \frac{\sec^4 x}{4} + C$ (Taking $\sec x = t$) Or getting $\frac{\tan^4 x}{4} + \frac{\tan^2 x}{2} + C$ (by taking $\tan x = t$)	1 ½ mk
26.	$A = \begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix} \Rightarrow A^2 = \begin{bmatrix} 16 & 8 \\ 56 & 32 \end{bmatrix}$ $A^2 - xI - yA = O \Rightarrow \begin{bmatrix} 16 & 8 \\ 56 & 32 \end{bmatrix} - \begin{bmatrix} x & 0 \\ 0 & x \end{bmatrix} - \begin{bmatrix} 3y & y \\ 7y & 5y \end{bmatrix} = O$ Solving to get $y = 8$ and $x = -8$. $A^2 - xI - yA = O \Rightarrow A(AA^{-1}) + 8IA^{-1} - 8AA^{-1} = 0$ $\Rightarrow AI + 8A^{-1} - 8I = 0$ $\therefore A^{-1} = \frac{8I - A}{8} = \frac{1}{8} \begin{bmatrix} 5 & -1 \\ -7 & 3 \end{bmatrix}$ (OR) $[1 \ x \ 1] \begin{bmatrix} 1 & 3 & 2 \\ 2 & 5 & 1 \\ 15 & 3 & 2 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ x \end{bmatrix} = O$ Simplifying to get $[1 + 2x + 15 \ 3 + 5x + 3 \ 2 + x + 2] \begin{bmatrix} 1 \\ 2 \\ x \end{bmatrix} = O$ Solving we get, $x^2 + 16x + 28 = 0 \Rightarrow x = -2, -14$.	½ mk ½ + ½ mks 1 mk ½ mk 1 ½ mk 1 ½ mk
27.	$\int x^2 \tan^{-1} x \, dx = \tan^{-1} x \cdot \frac{x^3}{3} - \int \left[\frac{1}{1+x^2} \cdot \frac{x^3}{3} \right] dx$ $= \tan^{-1} x \cdot \frac{x^3}{3} - \frac{1}{3} \int \left[x - \frac{x}{1+x^2} \right] dx$ $= \frac{x^3}{3} \tan^{-1} x - \frac{1}{3} \left(\frac{x^2}{2} \right) + \frac{1}{3} \times \frac{1}{2} \log(1+x^2) + C$ $= \frac{x^3}{3} \tan^{-1} x - \frac{x^2}{6} + \frac{1}{6} \log(1+x^2) + C_1$ $= \frac{x^3}{3} \tan^{-1} x + \frac{1}{6} \log(1+x^2) + C, \text{ where } C = C_1 - \frac{x^2}{6}$	1 mk 1 mk ½ mk ½ mk
28.	$\frac{dV}{dt} = 8 \text{ cm}^3/\text{s}, \frac{dS}{dt} = ? , x = 12 \text{ cm}$ $V = x^3 \Rightarrow \frac{dV}{dt} = 3x^2 \frac{dx}{dt} \Rightarrow \frac{dx}{dt} = \frac{8}{3x^2}$ $A = 6x^2 \Rightarrow \frac{dA}{dt} = 12x \frac{dx}{dt} \Rightarrow \frac{dA}{dt} = \frac{8}{3} \text{ cm}^2/\text{s}$	½ mk 1 mk (1+½) mk
29.	Let $P(x, y)$ lie on the line joining $A(1, 3)$ and $B(0, 0)$ such that P, A, B are collinear. $\Rightarrow ar(\Delta PAB) = 0 \Rightarrow \frac{1}{2} \begin{vmatrix} x & y & 1 \\ 1 & 3 & 1 \\ 0 & 0 & 1 \end{vmatrix} = 0 \Rightarrow y = 3x$ Now $ar(\Delta ABD) = \frac{1}{2} \begin{vmatrix} 1 & 3 & 1 \\ 0 & 0 & 1 \\ k & 0 & 1 \end{vmatrix} = 3 \Rightarrow k = \pm 2$.	½ mk 1 mk (1+½) mk
30.	$\tan^{-1} \left[2 \sin \left(2 \cos^{-1} \left(-\frac{\sqrt{3}}{2} \right) \right) + 2\sqrt{3} \right]$ $= \tan^{-1} \left[2 \sin \left(2 \times \left(\pi - \frac{\pi}{6} \right) \right) + 2\sqrt{3} \right]$ $= \tan^{-1} \left[2 \sin \left(\frac{5\pi}{3} \right) + 2\sqrt{3} \right]$	½ mk 1 mk

	$= \tan^{-1} \left[-2 \times \frac{\sqrt{3}}{2} + 2\sqrt{3} \right] = \tan^{-1} [\sqrt{3}] = \frac{\pi}{3}$ <p style="text-align: center;">(OR)</p> $\tan^{-1} \left(\tan \frac{5\pi}{6} \right) + \cos^{-1} \left(\cos \frac{13\pi}{3} \right) - \cot^{-1} (-\sqrt{3})$ $= \tan^{-1} \left[\tan \left(\pi - \frac{\pi}{6} \right) \right] + \cos^{-1} \left[\cos \left(4\pi + \frac{\pi}{3} \right) \right] - \cot^{-1} (-\sqrt{3})$ $= \tan^{-1} \left[-\tan \left(\frac{\pi}{6} \right) \right] + \cos^{-1} \left[\cos \left(\frac{\pi}{3} \right) \right] - (\pi - \cot^{-1} \sqrt{3})$ $= \tan^{-1} \left(-\frac{1}{\sqrt{3}} \right) + \cos^{-1} \left(\frac{1}{2} \right) - \left(\pi - \frac{\pi}{6} \right) = -\frac{\pi}{6} + \frac{\pi}{3} - \frac{5\pi}{6} = -\frac{2\pi}{3}$	(1+½) mk 1 mk 1 mk (½ + ½)mk
31.	$y = (\sin^{-1} x)^2$ $\frac{dy}{dx} = 2 \sin^{-1} x \cdot \frac{1}{\sqrt{1-x^2}}$ $\Rightarrow \sqrt{1-x^2} \cdot \frac{dy}{dx} = 2 \sin^{-1} x$ $\Rightarrow \sqrt{1-x^2} \cdot \frac{d^2y}{dx^2} + \frac{dy}{dx} \cdot \frac{1}{2\sqrt{1-x^2}} \cdot (-2x) = \frac{2}{\sqrt{1-x^2}}$ <p>Simplifying to get $(1-x^2) \frac{d^2y}{dx^2} - x \frac{dy}{dx} - 2 = 0$</p>	1 mk 1 mk 1 mk
32.	$f(x) = \sin^2 x - \cos x$ $f'(x) = 2 \sin x \cos x + \sin x$ <p>Solving $f'(x) = 0$ for critical points, we get $x = 0, x = -\frac{1}{2}$</p> $\Rightarrow x = 0 \text{ or } x = \frac{2\pi}{3}$ <p>Now, $f(0) = -1, f\left(\frac{2\pi}{3}\right) = \frac{5}{4}, f(\pi) = 1$</p> <p>$\therefore$ Absolute max value = $\frac{5}{4}$ and Absolute min value = -1</p> <p style="text-align: center;">(OR)</p> $f(x) = x^4 - 2x^2$ $f'(x) = 4x^3 - 4x$ $f'(x) = 0 \Rightarrow x = -1, 0, 1$ <p>Solving to get ; $f(x)$ is \uparrow for $(-1, 0) \cup (1, \infty)$ & \downarrow for $(-\infty, -1) \cup (0, 1)$.</p>	½ mk ½ mk ½ mk 1 mk ½ mk ½ mk ½ mk
33.	$\int \frac{x+2}{\sqrt{(x-2)(x-3)}} dx = \int \frac{x+2}{\sqrt{x^2-5x+6}} dx$ <p>Let $x+2 = A(2x-5) + B$</p> <p>Solving to get $A = \frac{1}{2}$ and $B = \frac{9}{2}$</p> $\therefore \int \frac{x+2}{\sqrt{(x-2)(x-3)}} dx = \frac{1}{2} \int \frac{2x-5}{\sqrt{x^2-5x+6}} dx + \frac{9}{2} \int \frac{1}{\sqrt{x^2-5x+6}} dx$ $= \frac{1}{2} \int \frac{1}{\sqrt{t}} dt + \frac{9}{2} \int \frac{1}{\sqrt{(x-\frac{5}{2})^2 - (\frac{1}{2})^2}} dx$ <p>Simplifying to get $\sqrt{x^2-5x+6} + \frac{9}{2} \log \left \left(x - \frac{5}{2} \right) + \sqrt{x^2-5x+6} \right + C$</p>	½ mk ½ mk ½ mk ½ mk ½ mk 1 mk ½ mk
34.	(i) (a) $2x - 7$ (ii) (c) 1 (iii) (b) Function is not differentiable	

	(iv) (d) No points of discontinuity (v) (d) No, because it is not a continuous function.	$\begin{cases} 1 \\ mk \\ each \end{cases}$
35.	(i) $\begin{bmatrix} 20 & 17 & 3 \\ 14 & 20 & 4 \\ 17 & 18 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} ₹1450 \\ ₹1800 \\ ₹1650 \end{bmatrix}$ (ii) $P = \frac{1}{2}(A + A') = \frac{1}{2} \begin{bmatrix} 40 & 31 & 20 \\ 31 & 40 & 22 \\ 20 & 22 & 6 \end{bmatrix}$	2 mks 2 mks
36.	$A = \begin{bmatrix} 3 & 1 & 2 \\ 3 & 2 & -3 \\ 2 & 0 & -1 \end{bmatrix} \quad \therefore A = 3(-2 + 0) - 1(-3 + 6) + 2(0 - 4) = -17$ $\therefore A^{-1}$ exists. Co-factor matrix $\rightarrow \begin{bmatrix} -2 & -3 & -4 \\ 1 & -7 & 2 \\ -7 & 15 & 3 \end{bmatrix}$ and $Adj A \rightarrow \begin{bmatrix} -2 & 1 & -7 \\ -3 & -7 & 15 \\ -4 & 2 & 3 \end{bmatrix}$ $\therefore A^{-1} = \frac{1}{ A } (Adj A) = -\frac{1}{17} \begin{bmatrix} -2 & 1 & -7 \\ -3 & -7 & 15 \\ -4 & 2 & 3 \end{bmatrix}$ Matrix equations : $\begin{bmatrix} 3 & 3 & 2 \\ 1 & 2 & 0 \\ 2 & -3 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 4 \\ 5 \end{bmatrix}$ It is of the form $A^T X = B$ $\Rightarrow X = (A^{-1})^T B = -\frac{1}{17} \begin{bmatrix} -2 & -3 & -4 \\ 1 & -7 & 2 \\ -7 & 15 & 3 \end{bmatrix} \begin{bmatrix} 1 \\ 4 \\ 5 \end{bmatrix}$ Solving to get $x = 2, y = 1, z = -4$ (OR) $AB = \begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix} \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix} = \begin{bmatrix} 6 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 6 \end{bmatrix}$ $\Rightarrow AB = 6I \quad \Rightarrow A \left(\frac{1}{6} B \right) = I \quad \Rightarrow A^{-1} = \frac{1}{6} B$ Matrix equations : $\begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 3 \\ 17 \\ 7 \end{bmatrix}$ It is of the form $AX = C$ $\Rightarrow X = A^{-1} C = \left(\frac{1}{6} B \right) C = \frac{1}{6} \begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix} \begin{bmatrix} 3 \\ 17 \\ 7 \end{bmatrix}$ \therefore Solving to get $x = 2, y = -1, z = 4$	1 mk 2 mks ½ mk ½ mk 1 mk 1 mk (1 + 1)mks
37.	Reflexive: Let $(a, b) \in A \times A$ $(a, b)R(a, b) \Rightarrow a + b = b + a$. Hence reflexive. Symmetric: Let $(a, b), (c, d) \in A \times A$ $(a, b)R(c, d) \Rightarrow a + d = b + c$ $\Rightarrow c + b = d + a \Rightarrow (c, d)R(a, b)$ Hence symmetric. Transitive: Let $(a, b), (c, d), (e, f) \in A \times A$ $(a, b)R(c, d)$ and $(c, d)R(e, f) \Rightarrow a + d = b + c$ and $c + f = d + e$ $\Rightarrow a + d + c + f = b + c + d + e$ $\Rightarrow a + f = b + e \Rightarrow (a, b)R(e, f)$ Equivalence class $[(2, 5)] = \{(1, 4), (2, 5), (3, 6), (4, 7), (5, 8), (6, 9)\}$	1 mk 2 mks 2 mks 1 mk
38.	Let $2x$ be the length and y be the breadth of the rectangle.	½ mk



$$\therefore x^2 + y^2 = r^2 \quad \text{---(i)}$$

Area of the rectangle,

$$A = 2x \cdot y \Rightarrow A^2 = (2x)^2 y^2 \quad \text{---(ii)}$$

$$\text{Let } B = A^2 = 4x^2 y^2$$

$$B = 4x^2(r^2 - x^2) \Rightarrow \frac{dB}{dx} = 4(2xr^2 - 4x^3)$$

$$\frac{dB}{dx} = 0 \Rightarrow 4(2xr^2 - 4x^3) = 0 \Rightarrow x = 0, x = \frac{r}{\sqrt{2}}$$

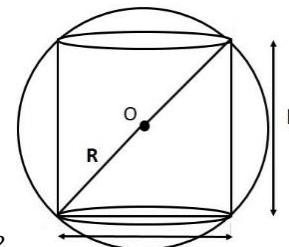
$$\text{Now } \frac{d^2B}{dx^2} = 2r^2 - 12x^2 = 2(2x^2) - 12x^2 < 0$$

$$\Rightarrow \text{Area is max, when } x = \frac{r}{\sqrt{2}}$$

$$\therefore \text{Dimensions of the rectangle} = \frac{r}{\sqrt{2}}, \frac{r}{\sqrt{2}} \text{ and Area} = 2xy = r^2$$

(OR)

Let x be the diameter of base and h be height of the cylinder.



$$\therefore x^2 + h^2 = (2R)^2$$

$$\text{Volume of cylinder, } V = \pi \left(\frac{x}{2}\right)^2 h = \frac{\pi}{4} h (4R^2 - h^2) \Rightarrow \frac{dV}{dh} = \frac{\pi}{4} (4R^2 - 3h^2)$$

$$\frac{dV}{dh} = 0 \Rightarrow 4R^2 - 3h^2 = 0 \Rightarrow h = \frac{2R}{\sqrt{3}}$$

$$\text{Now } \frac{d^2V}{dh^2} = \frac{\pi}{4} (-6h) < 0$$

$$\Rightarrow \text{Volume is max, when } h = \frac{2R}{\sqrt{3}}$$

$$\text{Also, max volume} = \pi \left(\frac{x}{2}\right)^2 \left(\frac{2R}{\sqrt{3}}\right) = \frac{4\pi R^3}{3\sqrt{3}} \text{ cu. units}$$

Fig: ½ mk

½ mk

1 ½ mk

1 ½ mk

1 mk

½ mk

Fig: ½ mk

½ mk

1 ½ mk

1 ½ mk

½ mk

1 mk

SET – B (Different questions)

1. (c) 8

2. (c) $\sqrt{3}$

3. (b) $\frac{1}{3} \sin x^3 + C$

6. (a) $\frac{1}{2\pi}$

9. (c) $\sin x + \cos x + C$

	19.	$-\frac{\pi}{4}$	
	21.	$\int \frac{dx}{\sqrt{5 - 4x - 2x^2}} = \frac{1}{\sqrt{2}} \int \frac{dx}{\sqrt{\frac{7}{2} - (x+1)^2}} = \frac{1}{\sqrt{2}} \sin^{-1} \frac{\sqrt{2}(x+1)}{\sqrt{7}} + C$	1 +1
	24.	$f(x) = \tan^{-1} \left(\frac{\cos x - \sin x}{\cos x + \sin x} \right) = \tan^{-1} \left(\frac{1 - \tan x}{1 + \tan x} \right)$ $= \tan^{-1} \left[\tan \left(\frac{\pi}{4} - x \right) \right]$ $f(x) = \frac{\pi}{4} - x$ $\therefore f'(x) = -1$ <p style="text-align: center;">(OR)</p> <p>Let $u = \sin^2 x$ and $v = e^{\cos x}$ Getting $\frac{du}{dx} = 2 \sin x \cos x$ And $\frac{dv}{dx} = -\sin x \cdot e^{\cos x}$ $\therefore \frac{du}{dv} = -2 \cos x \cdot e^{-\cos x}$</p>	$\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2} + \frac{1}{2}$ mk
	25.	$\int \frac{1}{(1+x)(2+x)} dx$ <p>Simplifying to get: $\int \frac{1}{1+x} dx - \int \frac{1}{2+x} dx$</p> <p>Final answer : $\log \left \frac{1+x}{2+x} \right + C$</p> <p style="text-align: center;">(OR)</p> $\int \frac{(x-3)e^{2x}}{(x-1)^3} dx = \int \frac{(x-1-2)}{(x-1)^3} e^x dx$ $= \int \left[\frac{1}{(x-1)^2} - \frac{2}{(x-1)^3} \right] e^x dx$ $= \frac{1}{(x-1)^2} e^x + C$	$1\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2} + \frac{1}{2}$ mk
	28.	$\int \frac{6x+7}{\sqrt{(x-5)(x-4)}} dx = \int \frac{6x+7}{\sqrt{x^2-9x+20}} dx$ <p>Let $6x+7 = A(2x-9) + B$ Solving to get $A = 3$ and $B = 34$ $\therefore \int \frac{6x+7}{\sqrt{(x-5)(x-4)}} dx$</p> $= 3 \int \frac{2x-9}{\sqrt{x^2-9x+20}} dx + 34 \int \frac{1}{\sqrt{x^2-9x+20}} dx$ $= 3 \int \frac{1}{\sqrt{t}} dt + 34 \int \frac{1}{\sqrt{\left(x-\frac{9}{2}\right)^2 - \left(\frac{1}{2}\right)^2}} dx$ <p>Simplify to get $6\sqrt{x^2-9x+20} + 34 \log \left \left(x - \frac{9}{2}\right) + \sqrt{x^2-9x+20} \right + C$</p>	$\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk $\frac{1}{2}$ mk 1 mk $\frac{1}{2}$ mk
	33.	$\frac{dr}{dt} = -3 \text{ cm/min}, \frac{dh}{dt} = 2 \text{ cm/min}, r = 7 \text{ cm}, h = 2 \text{ cm}$ $V = \pi r^2 h \Rightarrow \frac{dV}{dt} = \pi \left[r^2 \cdot \frac{dh}{dt} + 2hr \cdot \frac{dr}{dt} \right]$ <p>Solving to get $\frac{dV}{dt} = \pi [2r^2 - 6rh] = 44 \text{ cm}^3/\text{min}$</p>	$\frac{1}{2}$ mk $1 \frac{1}{2}$ mk 1 mk
	37.	Same as Q 36 of Set A $x = 0, y = -5, z = -3$ (OR) $x = 3, y = -2, z = -1$	

		SET – C (Different questions)	
	1.	(a) $-\frac{1}{4} \cos x^4 + C$	
	2.	(b) $\frac{1}{8\pi}$ units	
	3.	(d) 1	
	7.	(c) 7	
	9.	(a) $-\cos(\log x) + C$	
	13.	$\frac{x^7}{7} + C$	
	30.	$\begin{aligned}\int x^2 \cos^{-1} x \, dx &= \cos^{-1} x \cdot \frac{x^3}{3} - \int \left[\frac{-1}{\sqrt{1-x^2}} \cdot \frac{x^3}{3} \right] dx \\ &= \cos^{-1} x \cdot \frac{x^3}{3} + \frac{1}{3} \int \left[\frac{x^2}{\sqrt{1-x^2}} \cdot x \right] dx \\ &= \frac{x^3}{3} \cos^{-1} x - \frac{1}{3} \times \frac{1}{2} \int \frac{1-t}{\sqrt{t}} dt \\ &= \frac{x^3}{3} \cos^{-1} x - \frac{1}{6} \left[\int t^{-1/2} dt - \int t^{1/2} dt \right] \\ &= \frac{x^3}{3} \cos^{-1} x - \frac{1}{3} (\sqrt{1-x^2}) + \frac{1}{9} (1-x^2)^{3/2} + C\end{aligned}$	1 mk 1 mk ½ mk ½ mk