CCE RR

ಕರ್ನಾಟಕ ಪ್ರೌಢ ಶಿಕ್ಷಣ ಪರೀಕ್ಷಾ ಮಂಡಳಿ, ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು – 560 003

KARNATAKA SECONDARY EDUCATION EXAMINATION BOARD, MALLESWARAM, BANGALORE – 560 003

ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪರೀಕ್ಷೆ, ಜೂನ್ — 2017

S. S. L. C. EXAMINATION, JUNE, 2017

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ದಿನಾಂಕ : 16. 06. 2017] ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Date : 16. 06. 2017] **CODE NO. : 81-E**

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಹೊಸ ಪಠ್ಯಕ್ರಮ / New Syllabus)

(ಪುನರಾವರ್ತಿತ ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / Regular Repeater)

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

[ಗರಿಷ್ಠ ಅಂಕಗಳು : 80

[Max. Marks : 80

Qn. Nos.	Ans. Key	Value Points	Marks allotted
I. 1.	B	$\{6, 7, 8\}$	1
2.	C	90	1
3.	A	5	1
4.	D	$\sqrt{x-y}$	1
5.	B	18	1
6.	C	an acute angle	1
7.	D	$12\sqrt{2}$ cm	1
8.	A	13 units	1

Qn. Nos.	**Value Points**			**Marks allotted**
II.				
9.	$^{100}P_0 = 1$			1
10.	Probability of a certain event is 1			1
11.	Mid-point of the			
	class-interval = $\frac{5 + 15}{2}$		½	
	$= \frac{20}{2} = 10$		½	1
12.	**Method : 1**	**Method : 2**		
	cos 48° – sin 42°	cos 48° – sin 42°		
	$= \sin \cancel{4}2^\circ - \text{si}\cancel{\text{n}}\ 42^\circ$	$= \cos \cancel{4}8^\circ - \text{co}\cancel{\text{s}}\ 48^\circ$	½	
	= 0	= 0	½	1
13.	$y = 3x$ comparing with $y = mx + c$			
	slope $m = 3$		½	
	y-intercept = $c = 0$		½	1
14.	Total surface area of a			
	solid hemi-sphere = $3\pi r^2$ sq.units			1
III.	Solution :			
15.	$n(A) = 37,\ n(B) = 26,\ \ n(A \cup B) = 51$			
	$n(A \cap B) = ?$			
	$n(A \cup B) = n(A) + n(B) - n(A \cap B)$		1	
	$51 = 37 + 26 - n(A \cap B)$		½	
	$\therefore n(A \cap B) = 63 - 51$			2
	$n(A \cap B) = 12$		½	
16.	a) Arithmetic mean A.M. = $\frac{a + b}{2}$		1	2
	b) Harmonic mean H.M. = $\frac{2ab}{a + b}$		1	

Qn. Nos.	**Value Points**		**Marks allotted**
17.	Solution :		
	Here $a = 2$, $r = \frac{\frac{2}{3}}{2} = \frac{\cancel{2}}{3} \times \frac{1}{\cancel{2}} = \frac{1}{3}$	½	
	$S_\infty = ?$		
	$S_\infty = \frac{a}{1-r}$	½	
	$= \frac{2}{1-\frac{1}{3}} = \frac{2}{\frac{2}{3}}$	½	2
	$= \cancel{2} \times \frac{3}{\cancel{2}}$		
	∴ $S_\infty = 3$	½	
18.	Let us assume, $3 + \sqrt{5}$ is a rational number		
	$\Rightarrow 3 + \sqrt{5} = \frac{p}{q}$ where $p, q \in z, q \neq 0$	½	
	$\Rightarrow -3 + \frac{p}{q} = \sqrt{5}$		
	$\Rightarrow \frac{-3q+p}{q} = \sqrt{5}$	½	
	$\Rightarrow \sqrt{5}$ is a rational number $\because \frac{-3q+p}{q}$ is rational		2
	but $\sqrt{5}$ is not a rational number		
	this gives us contradiction	½	
	∴ our assumption $3 + \sqrt{5}$ is a rational number is wrong		
	$\Rightarrow 3 + \sqrt{5}$ is an irrational number	½	
19.	A triangle is formed by joining 3 non-collinear points.		
	∴ Total number of triangles that can be drawn out of 8 non-collinear points = ${}^{8}C_{3}$	½	
	Here $n = 8$, $r = 3$		
	${}^{n}C_{r} = \frac{n!}{(n-r)!\,r!}$	½	
	${}^{8}C_{3} = \frac{8!}{(8-3)!3!}$	½	2
	$= \frac{8 \times 7 \times \cancel{6} \times \cancel{5!}}{\cancel{5!} \times \cancel{3 \times 2}}$		
	$= 56$	½	

Qn. Nos.	Value Points		Marks allotted
	Alternate method :		
	Number of triangles $^{n}C_{3} = \frac{n(n-1)(n-2)}{6}$	1	
	If $n = 8$		2
	$^{8}C_{3} = \frac{8 \times 7 \times \cancel{6}}{\cancel{6}}$	½	
	$= 56$	½	
20.	Solution :		
	$\frac{1}{8\,!} + \frac{1}{9\,!} = \frac{x}{10\,!}$		
	$\frac{1}{8!} + \frac{1}{9 \times 8!} = \frac{x}{10 \times 9 \times 8!}$	½	
	$\frac{1}{\cancel{8!}}\left(1 + \frac{1}{9}\right) = \frac{x}{10 \times 9 \times \cancel{8!}}$	½	2
	$\frac{10}{\cancel{9}} = \frac{x}{10 \times \cancel{9}}$	½	
	$\therefore x = 100$	½	
21.	Solution :		
	There are 7 marbles, out of these 4 marbles can be drawn in $^{7}C_{4} = 35$ ways		
	$\therefore n(S) = 35$	½	
	Two marbles out of 4 red marbles can be drawn in $^{4}C_{2} = 6$ ways	½	
	The remaining 2 marbles must be black and they can be drawn in $^{3}C_{2} = 3$ ways	½	2
	$\therefore n(A) = {^{4}C_{2}} \times {^{3}C_{2}} = 6 \times 3 = 18$		
	$\therefore \quad P(A) = \frac{n(A)}{n(S)} = \frac{18}{35}$	½	

Qn. Nos.	Value Points	Marks allotted

22. Direct method :

x	x^2
5	25
6	36
7	49
8	64
9	81
$\Sigma x = 35$	$\Sigma x^2 = 255$

$N = 5$

table ½

Standard deviation

$$\sigma = \sqrt{\frac{\Sigma x^2}{N} - \left(\frac{\Sigma x}{N}\right)^2}$$ ½

$$= \sqrt{\frac{255}{5} - \left(\frac{35}{5}\right)^2}$$

$$= \sqrt{51 - 49}$$ ½

$$= \sqrt{2}$$

$\sigma = 1.4$ ½

2

Actual mean method :

x	$d = x - \overline{x}$	d^2
5	– 2	4
6	– 1	1
7	0	0
8	1	1
9	2	4

$\Sigma x = 35$ $\Sigma d^2 = 10$

$$\text{Mean} = \overline{x} = \frac{\Sigma x}{N}$$

$$= \frac{35}{5}$$

$$= 7$$ 1

standard deviation = $\sigma = \sqrt{\frac{\Sigma d^2}{N}}$ ½

$$= \sqrt{\frac{10}{5}} = \sqrt{2}$$

$\sigma = 1.4$ ½

2

Qn. Nos.	Value Points	Marks allotted

Assumed mean method :

Assumed mean $A = 6$ (any score can be taken)

x	$d = x - A$	d^2
5	-1	1
6	0	0
7	1	1
8	2	4
9	3	9

N = 5 $\Sigma d = 5$ $\Sigma d^2 = 15$ 1

Standard deviation $\sigma = \sqrt{\frac{\Sigma d^2}{N} - \left(\frac{\Sigma d}{N}\right)^2}$

$= \sqrt{\frac{15}{5} - \left(\frac{5}{5}\right)^2}$ ½ 2

$= \sqrt{3 - 1} = \sqrt{2}$

$\sigma = 1.4$ ½

Step deviation method :

Assumed mean $A = 7$, Common factor of the scores = $C = 1$

x	$d = \frac{x - A}{C}$	d^2
5	-2	4
6	-1	1
7	0	0
8	1	1
9	2	4

1 2

N = 5 $\Sigma d = 0$ $\Sigma d^2 = 10$

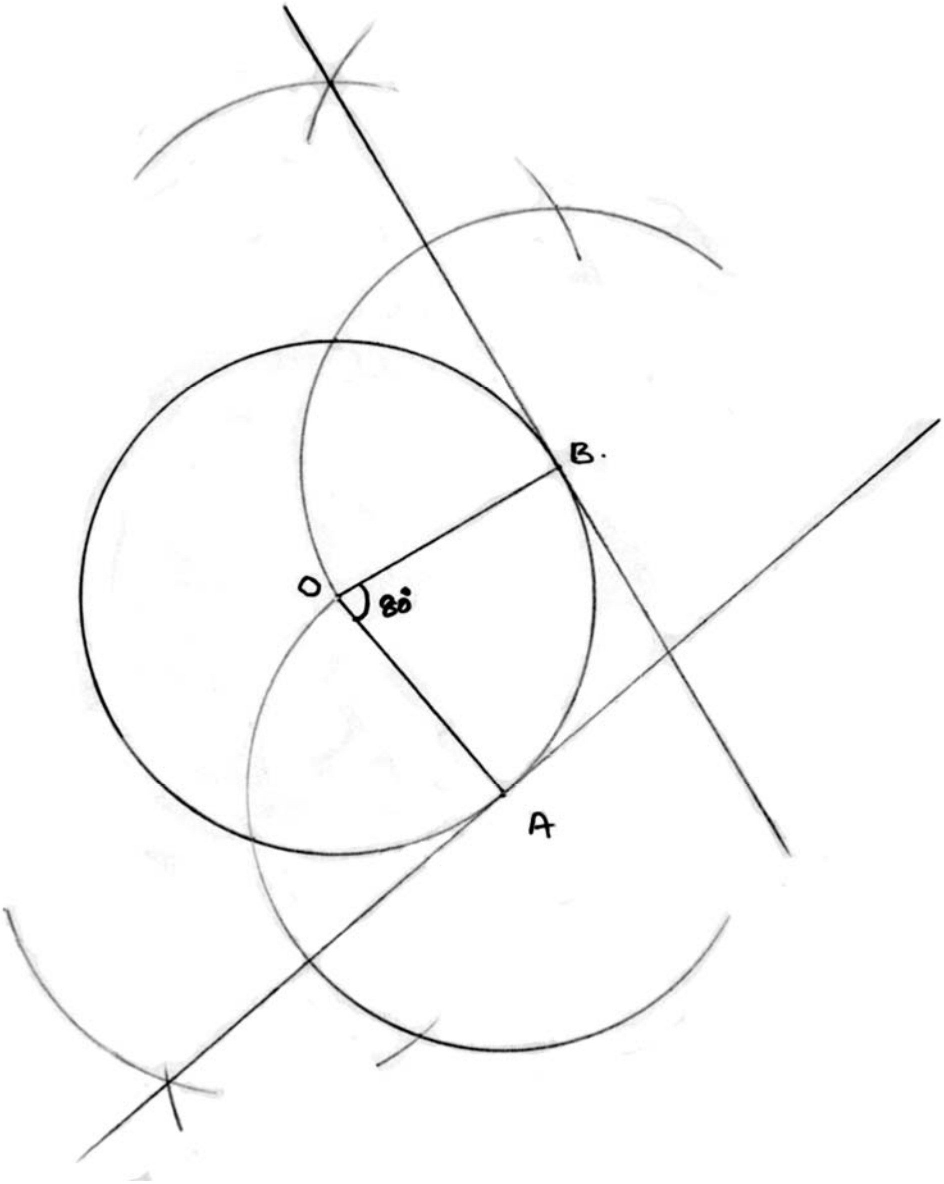
Standard deviation = $\sigma = \sqrt{\frac{\Sigma d^2}{N} - \left(\frac{\Sigma d}{N}\right)^2} \times C$ ½

$= \sqrt{\frac{10}{5} - 0} \times 1$

$= \sqrt{2}$

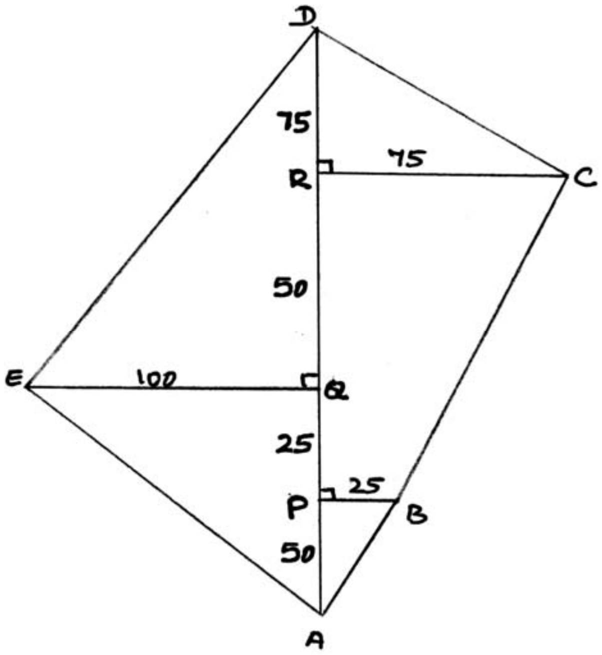
$\sigma = 1.4$ ½

Qn. Nos.	Value Points	Marks allotted
23.	The equation is in the form of $ax^2 + bx + c = 0$	
	where $a = 1$, $b = -2$, $c = -4$ ½	
	$\therefore x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ ½	
	$= \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \times 1 \times -4}}{2 \times 1}$	2
	$= \frac{2 \pm \sqrt{4 + 16}}{2}$ ½	
	$= \frac{2 \pm 2\sqrt{5}}{2}$	
	$= \frac{\cancel{2}(1 \pm \sqrt{5})}{\cancel{2}}$	
	$(1 + \sqrt{5})$ and $(1 - \sqrt{5})$ are the roots of the given quadratic equation ½	
	OR	
	This is in the form of $ax^2 + bx + c = 0$	
	where $a = 1$, $b = -2$, $c = -3$ ½	
	$\therefore \quad \Delta = b^2 - 4ac$	
	$= (-2)^2 - 4 \times 1 \times (-3)$ ½	2
	$= 4 + 12$	
	$= 16$ ½	
	$\Delta > 0$ $\therefore$ roots are real and distinct ½	

Qn. Nos.	**Value Points**		**Marks allotted**
24.	radius = r = 3·5 cm angle between the radii = 80°		
			
	circle	½	2
	angle between the radii	½	
	tangents at A and B	1	

Qn. Nos.	**Value Points**			**Marks allotted**
25.	In $\Delta\ ABC$ and $\Delta\ ADC$			
	$B\hat{A}C = A\hat{D}C$	given		
	$A\hat{C}B = A\hat{C}D$	common angle		
	$\therefore\quad \Delta\ ACB \sim \Delta\ DCA$	equiangular triangles	1	
	$\therefore\quad \frac{AC}{DC} = \frac{CB}{CA}$	AA – criteria	½	2
	$\therefore\quad AC^2 = BC \times DC$		½	
	OR			
	In ⊿ABC, $A\hat{B}C = 90°$ and $BD \perp AC$			
	$\therefore\quad AB^2 = AD \times AC \rightarrow (1)$ corollary		½	
	similarly $BC^2 = CD \times AC \rightarrow (2)$ corollary		½	
	dividing (1) by (2)			2
	$\frac{AB^2}{BC^2} = \frac{AD \times \cancel{AC}}{CD \times \cancel{AC}}$		½	
	$\therefore\quad \frac{AB^2}{BC^2} = \frac{AD}{CD}$		½	
26.	$\sin 30° = \frac{1}{2}$			
	$\cos 60° = \frac{1}{2}$, $\tan 45° = 1$		1	
	$\therefore\quad \sin 30°. \cos 60° - \tan^2 45°$			2
	$= \frac{1}{2} \times \frac{1}{2} - (1)^2$			
	$= \frac{1}{4} - 1 = \frac{1-4}{4}$		½	
	$= -\frac{3}{4}$		½	

Qn. Nos.	**Value Points**		**Marks allotted**
27.	Solution :		
	$(x_1, y_1) = (-5, 4)$		
	$(x_2, y_2) = (-7, 1)$	½	
	$\therefore\ d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	½	
	radius of the circle $= \sqrt{[-7-(-5)]^2 + (1-4)^2}$		
	$= \sqrt{(-7+5)^2 + (-3)^2}$	½	2
	$= \sqrt{(-2)^2 + (-3)^2}$		
	$= \sqrt{4 + 9}$		
	$r = \sqrt{13}$	½	
28.	ratio between the radii of two cylinders $r_1 : r_2 = 2 : 3$ ratio between their curved surface areas $S_1 : S_2 = 5 : 6$	½	
	$\therefore\ \frac{S_1}{S_2} = \frac{\cancel{2}\pi r_1 h_1}{\cancel{2}\pi r_2 h_2}$	½	2
	$\frac{5}{6} = \frac{2h_1}{3h_2}$	½	
	$\therefore\ \frac{h_1}{h_2} = \frac{5 \times \cancel{3}}{\cancel{6}_2 \times 2} = \frac{5}{4}$		
	ratio between their heights = 5 : 4	½	

Qn. Nos.	**Value Points**		**Marks allotted**
29.	Sphere - radius = r_1 = 10 cm		
	Cone - height = h_2 = 10 cm		
	- radius = r_2 = 5 cm		
	Number of small cones formed = $\frac{volume\ of\ the\ sphere}{volume\ of\ each\ small\ cone}$	½	
	$= \frac{\frac{4}{\cancel{3}}\cancel{\pi} r_1^3}{\frac{1}{\cancel{3}}\cancel{\pi} r_2^2 h_2}$	½	
	$= \frac{4 \times \overset{2}{\cancel{10}} \times \overset{2}{\cancel{10}} \times \cancel{10}}{\cancel{5} \times \cancel{5} \times \cancel{10}}$	½	2
	= 16		
	Number of small cones formed = 16	½	
30.	Scale :		
	25 m = 1 cm		
	50 m = 2 cm		
	75 m = 3 cm		
	100 m = 4 cm		
	125 m = 5 cm		
	200 m = 8 cm.		
			
	Calculation	½	
	Plan drawing	1½	2

Qn. Nos.	Value Points		Marks allotted
IV. 31.	Rationalising factor of $\sqrt{6}-\sqrt{3}$ is $\sqrt{6}+\sqrt{3}$		
	$\therefore \dfrac{\sqrt{6}+\sqrt{3}}{\sqrt{6}-\sqrt{3}} \times \dfrac{\sqrt{6}+\sqrt{3}}{\sqrt{6}+\sqrt{3}}$	1	
	$= \dfrac{\left(\sqrt{6}+\sqrt{3}\right)^2}{\left(\sqrt{6}+\sqrt{3}\right)\left(\sqrt{6}-\sqrt{3}\right)}$	½	3
	$= \dfrac{6+3+2\sqrt{6}.\sqrt{3}}{6-3}$	½	
	$= \dfrac{9+2\sqrt{18}}{3}$	½	
	$= \boxed{\dfrac{9+6\sqrt{2}}{3}}$ $= \dfrac{\cancel{3}(3+2\sqrt{2})}{\cancel{3}}$ $= \boxed{3+2\sqrt{2}}$	½	
32.	$\begin{array}{r\|l} & x^2+3x-8 \\ \hline x+1 & \cancel{x^3}+4x^2-5x+6 \\ & \cancel{x^3}+x^2 \\ & (-)\quad(-) \\ \hline & \quad 3\cancel{x^2}-5x+6 \\ & \quad 3\cancel{x^2}+3x \\ & \quad (-)\quad(-) \\ \hline & \qquad -\cancel{8x}+6 \\ & \qquad -8x-8 \\ & \qquad (+)\quad(+) \\ \hline & \qquad\qquad 14 \end{array}$	1	3
	Quotient $\boxed{q(x) = x^2+3x-8}$	½	
	remainder $\boxed{r(x) = 14}$	½	

Qn. Nos.	**Value Points**		**Marks allotted**
	Verification :		
	$g(x) \times q(x) + r(x)$		
	$= (x+1)(x^2+3x-8)+14$		
	$= x^3 + 3x^2 - 8x + x^2 + 3x - 8 + 14$	½	
	$= x^3 + 4x^2 - 5x + 6$		
	$= p(x)$		
	$\therefore \boxed{p(x) = [g(x) \times q(x)] + r(x)}$	½	
	OR		
	Synthetic division :		
	$\begin{array}{r\|rrrr} -2 & 4 & -16 & -9 & -36 \\ & & -8 & 48 & -78 \\ \hline & 4 & -24 & 39 & -114 \end{array}$	2	
	$\therefore$ The quotient is $4x^2 - 24x + 39$	½	3
	remainder $r(x) = -114$	½	
33.	Let the three conscutive + *ve* integers		
	be x, $(x+1)$ and $(x+2)$	½	
	from the statement,		
	$x^2 + (x+1)(x+2) = 92$	1	
	$x^2 + x^2 + 2x + x + 2 = 92$		
	$2x^2 + 3x + 2 = 92$		
	$2x^2 + 3x + 2 - 92 = 0$		
	$2x^2 + 3x - 90 = 0$ $\quad 2 \times -90 = -180$	½	
	$2x^2 - 12x + 15x - 90 = 0$ $\quad \wedge$		3
	$2x(x-6) + 15(x-6) = 0$ $\quad 15 - 12$		
	$(x-6)(2x+15) = 0$	½	
	$\therefore \quad x = 6$, *or* $x = -\frac{15}{2}$		
	The three consecutive + *ve*		
	integers are 6, 7, 8	½	
	OR		

Qn. Nos. | **Value Points** | **Marks allotted**

Let the numbers be x, y and $x > y$ ½

sum of their squares is 180

i.e. $x^2 + y^2 = 180 \rightarrow (1)$ ½

Square of the smaller number is equal to 8 times the bigger number

$\therefore \quad y^2 = 8x \rightarrow (2)$ ½

Substituting (2) in (1) we get

$x^2 + 8x = 180$

$x^2 + 8x - 180 = 0$ − 180 3

$x^2 + 18x - 10x - 180 = 0$ ½

$x(x + 18) - 10(x + 18) = 0$ 18 − 10

$(x - 10)(x + 18) = 0$

$\therefore \quad x = 10 \; or \; x = -18$ ½

If $x = 10$ then $y^2 = 8x$

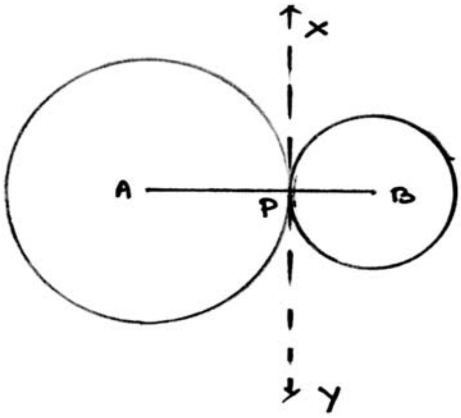
$y^2 = 8 \times 10$

$y = \sqrt{80} = \sqrt{16 \times 5}$

$= 4\sqrt{5}$ ½

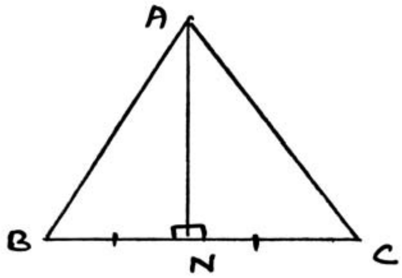
The numbers are 10 and $4\sqrt{5}$

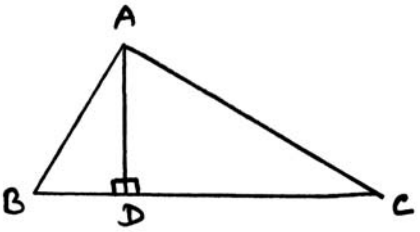
34.



½

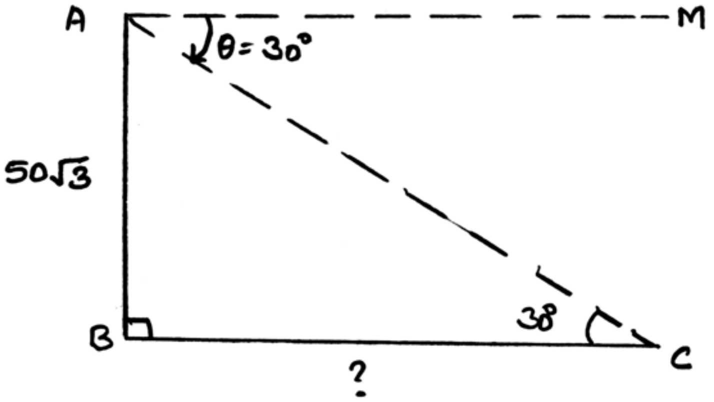
Data : A and B are the centres of touching circles. P is the point of contact ½

Qn. Nos.	Value Points	Marks allotted
	To prove : A, P and B are collinear ½	
	Construction : Tangent XY is drawn at P ½	
	Proof : In the figure	3
	$A\hat{P}X = 90° \rightarrow (1)$ } radius drawn at the point of contact $B\hat{P}X = 90° \rightarrow (2)$ } is perpendicular to the tangent ½	
	$A\hat{P}X + B\hat{P}X = 90° + 90°$ by adding (1) and (2)	
	$A\hat{P}B = 180°$ $A\hat{P}B$ is a straight angle	
	$\therefore$ APB is a straight line	
	$\therefore$ A, P and B are collinear ½	
35.	In $\triangle ABC$, $AB = BC = CA$ $AN \perp BC$ $\therefore BN = NC = \frac{1}{2}BC = \frac{1}{2}AB$ In ◺ ABN, $A\hat{N}B = 90°$ $\therefore AB^2 = AN^2 + BN^2$ 	
	½ + ½	
	$AN^2 = AB^2 - BN^2$ ½	
	$= AB^2 - \left(\frac{1}{2}AB\right)^2$	
	½	3
	$= AB^2 - \frac{AB^2}{4}$	
	$AN^2 = \frac{4AB^2 - AB^2}{4}$ ½	
	$\boxed{4AN^2 = 3AB^2}$ ½	
	OR	

Qn. Nos.	**Value Points**	**Marks allotted**
	 ½	
	In $\triangle ABD$, $A\hat{D}B = 90°$	
	$\therefore \quad AB^2 = AD^2 + BD^2$ ½	
	$AD^2 = AB^2 - BD^2 \rightarrow (1)$ ½	3
	In $\triangle ADC$, $A\hat{D}C = 90°$	
	$\therefore AC^2 = AD^2 + DC^2$ ½	
	$AD^2 = AC^2 - DC^2 \rightarrow (2)$ ½	
	from (1) and (2)	
	$AB^2 - BD^2 = AC^2 - DC^2$	
	$\therefore AB^2 + DC^2 = AC^2 + BD^2$ ½	
36.	LHS = $\tan^2 A - \sin^2 A$	
	$= \frac{\sin^2 A}{\cos^2 A} - \sin^2 A \qquad \because \tan A = \frac{\sin A}{\cos A}$ ½	
	$= \frac{\sin^2 A - \sin^2 A \cos^2 A}{\cos^2 A}$ ½	
	$= \frac{\sin^2 A \ (1 - \cos^2 A)}{\cos^2 A}$ ½	3
	but $1 - \cos^2 A = \sin^2 A$	
	$= \frac{\sin^2 A \ . \ \sin^2 A}{\cos^2 A}$ ½	
	$= \frac{\sin^2 A}{\cos^2 A} \ . \sin^2 A$ ½	
	$= \tan^2 A \ . \ \sin^2 A.$ ½	
	$\therefore$ LHS = RHS	

Qn. Nos.	Value Points			Marks allotted
	Alternate method :			
	LHS = $\tan^2 A - \sin^2 A$			
	$= (\sec^2 A - 1) - \sin^2 A$	$\because \tan^2 A = \sec^2 A - 1$	½	
	$= \dfrac{1}{\cos^2 A} - 1 - (1 - \cos^2 A)$	$\because \sec^2 A = \dfrac{1}{\cos^2 A}$ $\sin^2 A = 1 - \cos^2 A$	½	
	$= \dfrac{1 - \cos^2 A - \cos^2 A + \cos^4 A}{\cos^2 A}$		½	
	$= \dfrac{1 - 2\cos^2 A + \cos^4 A}{\cos^2 A}$			
	$= \dfrac{(1 - \cos^2 A)^2}{\cos^2 A}$	$\because 1 - 2\cos^2 A + \cos^4 A$ $= (1 - \cos^2 A)^2.$	½	3
	$= \dfrac{(\sin^2 A)^2}{\cos^2 A}$	$\because 1 - \cos^2 A = \sin^2 A$	½	
	$= \dfrac{\sin^2 A}{\cos^2 A} \cdot \sin^2 A$			
	$= \tan^2 A \cdot \sin^2 A.$			
	$\therefore$ LHS = RHS.		½	
	OR			

Qn. Nos. | **Value Points** | **Marks allotted**



1

Let AB represents height of the building

$AB = 50\sqrt{3}$ m

BC be the distance between the building and the object

Angle of depression is 30°

Since $AM \mid\mid BC$, So $M\hat{A}C = A\hat{C}B = 30°$ ½

In $\triangle$ ABC, $A\hat{B}C = 90°$, $A\hat{C}B = 30°$ 3

$\therefore \tan 30° = \frac{AB}{BC}$ ½

$\frac{1}{\sqrt{3}} = \frac{50\sqrt{3}}{BC}$ ½

$\therefore BC = 50\sqrt{3} \times \sqrt{3}$

$= 50 \times 3$

$\left.\begin{array}{l}\text{distance between the}\\\text{building and the object}\end{array}\right\} = 150$ m ½

V. 37. In an AP

$T_3 + T_5 = 30$ ½

$a + 2d + a + 4d = 30$

$2a + 6d = 30$

$a + 3d = 15 \rightarrow (1)$ ½

and $T_4 + T_8 = 46$

$a + 3d + a + 7d = 46$

$2a + 10d = 46$

$a + 5d = 23 \rightarrow (2)$ ½

Qn. Nos.	**Value Points**	**Marks allotted**
	Subtracting (1) from (2)	4
	$a \cancel{+} 5d = 23$	
	$-\cancel{a} + 3d = 15$	
	$\quad (-) \quad (-)$ ½	
	$2d = 8$	
	$\therefore \quad d = 4$ 1	
	If $d = 4$ then $a + 3d = 15$	
	$a + 3 \times 4 = 15$	
	$a + 12 = 15$	
	$a = 15 - 12 = 3$ ½	
	If $a = 3$ and $d = 4$ then the AP is	
	3, 7, 11, 15, ... ½	
	OR	
	In a GP $T_4 = 8$	
	$ar^3 = 8 \rightarrow (1)$ ½	
	and $T_8 = 128$	
	$ar^7 = 128 \rightarrow (2)$ ½	
	dividing (2) by (1) we get	
	$\frac{\cancel{a}r^7}{\cancel{a}r^3} = \frac{\cancel{128}^{16}}{\cancel{8}}$ ½	
	$r^4 = 16$	
	$\therefore \boxed{r = 2}$ ½	
	If $r = 2$ then $ar^3 = 8$	
	$a(2)^3 = 8$	
	$8a = 8$	
	$\therefore \boxed{a = 1}$ ½	
	If $a = 1$ and $r = 2$ then	4
	$S_n = \frac{a\left(r^n - 1\right)}{r - 1}$ ½	
	$\therefore \quad S_{10} = \frac{1\left(2^{10} - 1\right)}{2 - 1}$ ½	
	$= 1024 - 1$	
	$\boxed{S_{10} = 1023}$ ½	

Qn. Nos. | **Value Points** | **Marks allotted**

38. $x^2 - 2x - 3 = 0$

$\therefore \quad y = x^2 - 2x - 3$

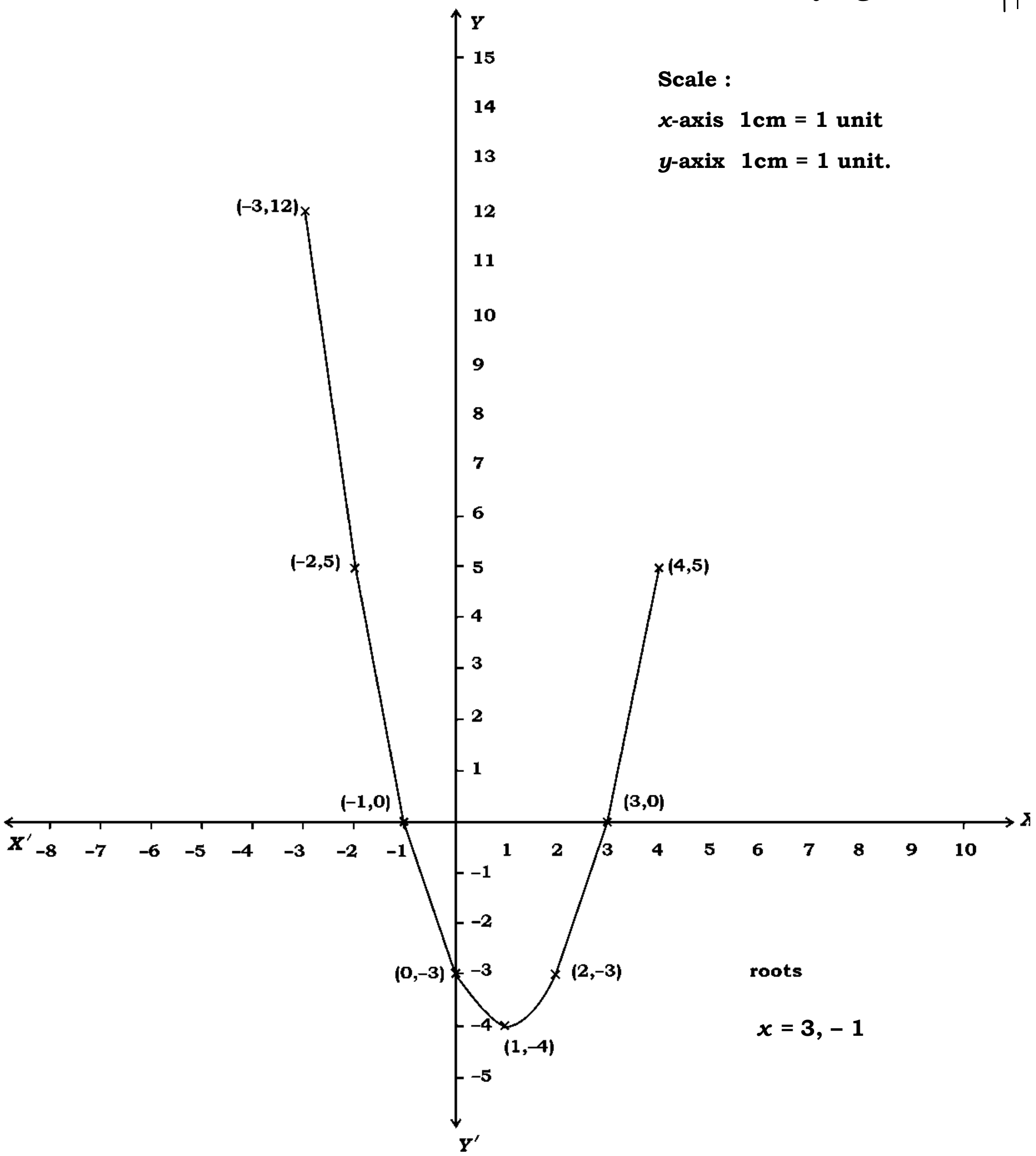
x	0	1	2	3	4	– 1	– 2	– 3
y	– 3	– 4	– 3	0	5	0	5	12

table 2

Drawing parabola 1

identifying roots 1

4



Scale :

x-axis 1cm = 1 unit

y-axix 1cm = 1 unit.

roots

$x = 3, - 1$

Alternate method :

$$x^2 - 2x - 3 = 0$$

$\boxed{y = x^2}$ $\boxed{y = +2x + 3}$

$y = x^2$

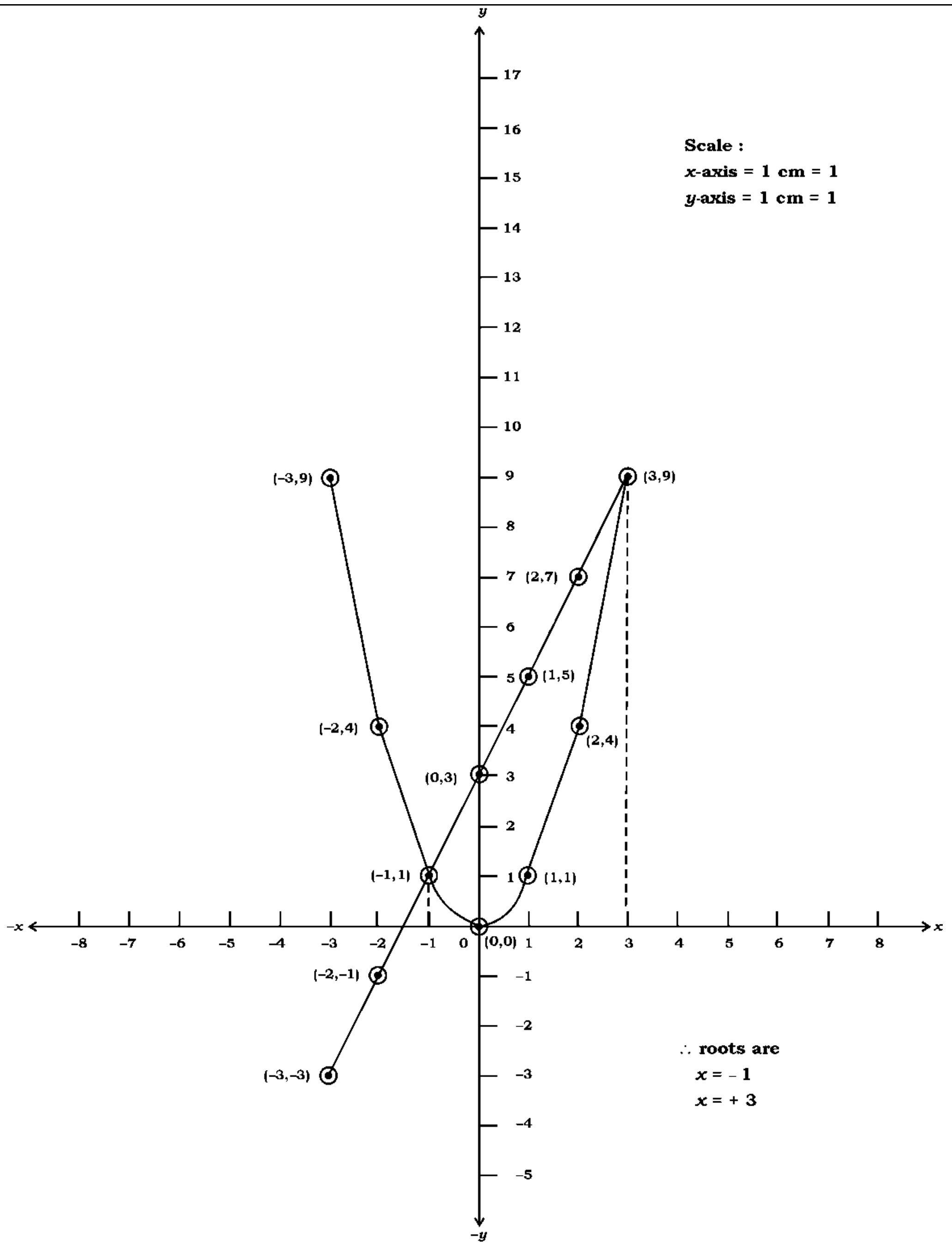
x	− 3	− 2	− 1	0	1	2	3
y	9	4	1	0	1	4	9

$y = 2x + 3$

x	− 3	− 2	− 1	0	1	2	3
y	− 3	− 1	1	3	5	7	9

Table —	2	
Drawing parabola —	1	
Identifying roots —	1	4

Qn. Nos.	Value Points	Marks allotted

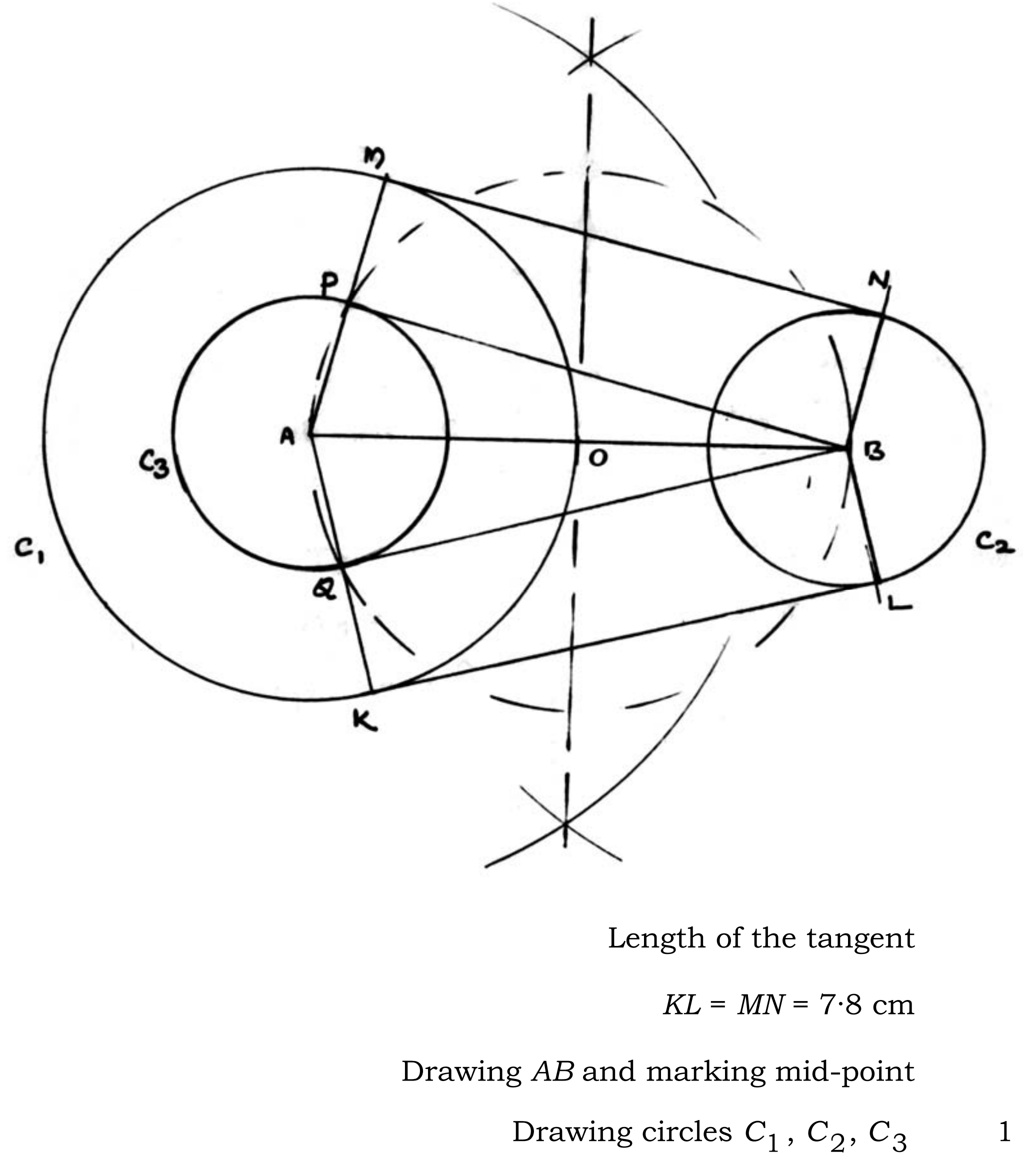


∴ roots are

$x = -1$

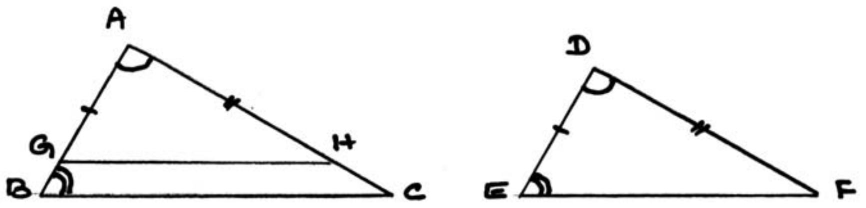
$x = +3$

Qn. Nos.	Value Points		Marks allotted
39.	$d = 8$ cm $R = 4$ cm $r = 2$ cm		
	$R - r = 4 - 2 = 2$ cm		



	Length of the tangent		
	$KL = MN = 7{\cdot}8$ cm		
	Drawing AB and marking mid-point	1	
	Drawing circles C_1, C_2, C_3	$1\frac{1}{2}$	4
	Joining BP, BQ, MN, KL	1	
	Measuring and writing the length of tangents	½	

Qn. Nos.	**Value Points**	**Marks allotted**
40.		



½

Data : In $\triangle$ ABC and $\triangle$ DEF

$B\hat{A}C = E\hat{D}F$, $A\hat{B}C = D\hat{E}F$ ½

To prove : $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$ ½

Construction : Points G and H are marked on AB and AC such that $AG = DE$ and $AH = DF$. G and H joined. ½

Proof :

	In $\triangle$ AGH and $\triangle$ DEF		
	$AG = DE$	construction	
	$G\hat{A}H = E\hat{D}F$	data	
	$AH = DF$	construction	½
$\therefore$ $\triangle$	$AGH \cong \triangle DEF$	SAS postulate	
	$\therefore GH = EF$ $A\hat{G}H = D\hat{E}F$	$CPCT$	½
but	$D\hat{E}F = A\hat{B}C$	data	
$\therefore$	$A\hat{G}H = A\hat{B}C$	alternate angles	
	$\therefore$ $GH \mid\mid BC$		½
$\therefore$	$\frac{AB}{AG} = \frac{BC}{GH} = \frac{AC}{AH}$	cor. BPT	

but $AG = DE$, $GH = EF$, $AH = DF$

$\therefore$ $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$ ½

4