

SECOND TERMINAL EVALUATION 2024 – 2025

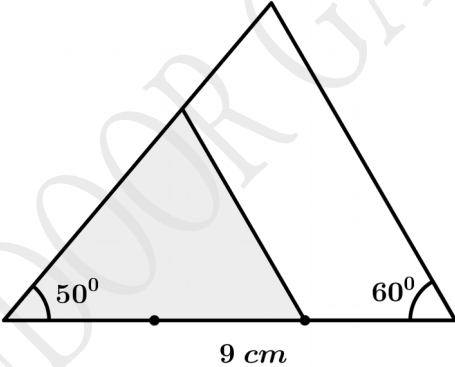
A	MATHEMATICS EM – ANSWER KEY	E-903
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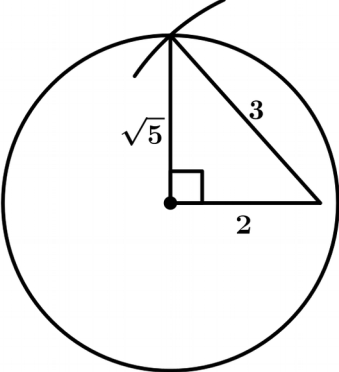
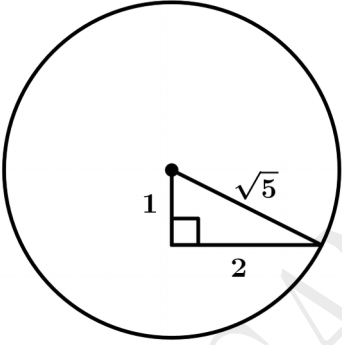
Qn no.	Key	Score
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Each questions from 1 to 4 carries 2 scores. (Answer any 3)

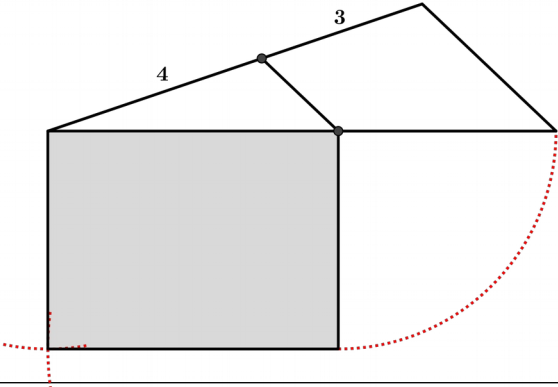
1	a) $PR = 3 \text{ cm}$. b) $PQ = 2 \text{ cm}$	1 1 2
2	a) Length of a side = $2 + 5 = 7 \text{ unit}$ b) Area = $7 \times 7 = 49 \text{ sq. unit}$	1 1 2
3	Diameter = 10 cm Radius = 5 cm	1 1 2
4	$(x - y)^2 = 18^2 - 4 \times 45 = 144$ $[\because (x - y)^2 = (x + y)^2 - 4xy]$ $x - y = \sqrt{144} = 12$	1 1 2

Each questions from 5 to 10 carries 3 scores. (Answer any 4)

5	For dividing 9 cm long side into 3 equal parts. For drawing a line parallel to the side opposite 50° through the second point which divide it into 3 equal parts and completing the triangle.	1 2 3
		
OR , $9 \times \frac{2}{3} = 6$, For draw a line of length 6 cm and draw the angles 50° and 60° at its ends.		
6	a) $(\sqrt{3} + 1)(\sqrt{3} - 1) = (\sqrt{3})^2 - 1 = 2$ b) $\frac{1}{\sqrt{3} + 1} = \frac{\sqrt{3} - 1}{2}$ $= \frac{1.73 - 1}{2} = \frac{0.73}{2} = 0.365$	1 1 1 3
7	a) Area of the larger circle = $\pi \times 5^2 = 25\pi \text{ sq. cm}$ b) Area of the shaded region = Area of the larger circle - Area of the smaller circle = $\pi \times 5^2 - \pi \times 3^2 = 16\pi \text{ sq. cm}$	1 1 2 3

8	<p>$[\because 5 = \left(\frac{5+1}{2}\right)^2 - \left(\frac{5-1}{2}\right)^2 \implies 3^2 - 2^2 = (\sqrt{5})^2]$</p>  <p>OR ,</p> <p>$[\because 2^2 + 1^2 = 5]$</p> 	3	3
9	<p>a) $p(2) = 7 \times 2 + 2 = 14 + 2 = 16$</p> <p>b) $p(-2) = 7 \times (-2) + 2 = -14 + 2 = -12$</p> <p>$p(2) + p(-2) = 16 + (-12) = 4$</p>	1 1 1	3
10	<p>a) $AD = \frac{2\sqrt{2}}{2} = \sqrt{2} \text{ cm}$</p> <p>b) $CD = \sqrt{3} \text{ cm}$ [In right triangle ADC , $(\sqrt{2})^2 + CD^2 = (\sqrt{5})^2$]</p> <p>c) Area of the triangle ABC = $\frac{1}{2} \times 2\sqrt{2} \times \sqrt{3} = \sqrt{6} \text{ sq. cm.}$</p>	1 1 1	3
Each questions from 11 to 21 carries 4 scores. (Answer any 8)			
11	<p>a) $PC : PD = 2 : 1$</p> <p>b) $PA = 12 \times \frac{2}{3} = 8 \text{ cm}$, $PB = 12 \times \frac{1}{3} = 4 \text{ cm}$</p> <p>c) $PD = 2 \times 5 = 10 \text{ cm}$</p>	1 2 1	4
12	<p>a) $r = \frac{4}{2} = 2 \text{ cm}$</p> <p>b) Area = $\pi \times 2^2 = 4\pi \text{ sq. cm}$</p> <p>c) $\pi \times (2r)^2 = 4\pi r^2$</p> <p>Area is increased by 4 times</p>	1 1 1 1	4

13	<table border="1"> <thead> <tr> <th>x</th> <th>y</th> <th>$x + y$</th> <th>$x + y$</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>-5</td> <td>$4 + -5 = 9$</td> <td>$4 + (-5) = 1$</td> </tr> <tr> <td>-1</td> <td>-3</td> <td>$-1 + -3 = 4$</td> <td>$-1 + (-3) = 4$</td> </tr> </tbody> </table>	x	y	$ x + y $	$ x + y $	4	-5	$ 4 + -5 = 9$	$ 4 + (-5) = 1$	-1	-3	$ -1 + -3 = 4$	$ -1 + (-3) = 4$	4	4
x	y	$ x + y $	$ x + y $												
4	-5	$ 4 + -5 = 9$	$ 4 + (-5) = 1$												
-1	-3	$ -1 + -3 = 4$	$ -1 + (-3) = 4$												
14	<p>a) Perimeter = $5 + 6 + 9 = 20 \text{ cm}$</p> <p>b) $s = \frac{20}{2} = 10$</p> <p>Area = $\sqrt{10 \times 5 \times 4 \times 1} = \sqrt{200} = 10\sqrt{2} \text{ sq.cm}$</p> <p>$[\because \text{Area} = \sqrt{s(s-a)(s-b)(s-c)}, s = \frac{\text{Perimeter}}{2}]$</p>	1 1 2	4												
15	<p>a) Longer side = $x + 2$</p> <p>b) $a(x) = x(x + 2) = x^2 + 2x$</p> <p>c) $a(10) = 10^2 + 2 \times 10 = 100 + 20 = 120$</p>	1 2 1	4												
16	<p>a) Numbers = $7, -7$</p> <p>b) $x = 5 + 3 = 8, x = 5 - 3 = 2$</p>	2 2	4												
17	<p>a) If the numbers are taken as x and y, then</p> $3x + 5y = 86 \quad (1)$ $4x - 2y = 28 \quad (2)$ <p>b) $(1) \times 2 : 6x + 10y = 172 \quad (3)$</p> $(2) \times 5 : 20x - 10y = 140 \quad (4)$ $(3) + (4) : 26x = 312 \implies x = \frac{312}{26} = 12$ $48 - 2y = 28 \implies y = \frac{20}{2} = 10$	1 1 1 1	4												
18	<p>a) $PQ = \frac{8}{2} = 4 \text{ cm}$ [\because PQR and ABC similar triangles, $\frac{PR}{AC} = \frac{1}{2}$]</p> <p>b) Area of $\Delta PQR = \frac{1}{2} \times 3 \times 4 = 6 \text{ sq.cm}$</p> <p>c) $\left(\frac{PR}{AC}\right)^2 = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$</p>	1 2 1	4												
19	<p>a) $r = \frac{6}{2} = 3 \text{ cm}$</p> <p>b) Perimeter of the figure = $3\pi + 6 + 3\pi + 6 = 12 + 6\pi$ $= 12 + 6 \times 3.14 = 30.84 \text{ cm}$</p>	1 2 1	4												

20	<p>For drawing a line of length 9 cm .</p> <p>For dividing this line in the ratio 4 : 3 .</p> <p>For completing the rectangle .</p> 	1 2 1	4
21	<p>a) Length of bottom side of large triangle = $9 \times \frac{4}{3} = 12 \text{ cm}$</p> <p>b) Height of the larger triangle = $6 \times \frac{4}{3} = 8 \text{ cm}$</p> <p>c) Perimeter of the larger triangle = $24 \times \frac{4}{3} = 32 \text{ cm}$</p> <p>d) Scale factor of the areas = $\left(\frac{4}{3}\right)^2 = \frac{16}{9}$</p>	1 1 1 1	4
Each questions from 22 to 29 carries 5 scores. (Answer any 6)			
22	<p>If the numbers are taken as x and y , then</p> <p>$(x + 1)(y + 1) = 1581 \implies xy + x + y + 1 = 1581 \implies xy + x + y = 1580$ (1)</p> <p>$(x - 1)(y - 1) = 1421 \implies xy - (x + y) + 1 = 1421 \implies xy - (x + y) = 1420$ (2)</p> <p>a) $xy = \frac{1580 + 1420}{2} = \frac{3000}{2} = 1500$ [\because (1) + (2) : $2xy = 3000$]</p> <p>b) $x + y = \frac{1580 - 1420}{2} = \frac{160}{2} = 80$</p> <p>c) $x - y = \sqrt{80^2 - 4 \times 1500} = \sqrt{6400 - 6000} = \sqrt{400} = 20$ [$\because (x - y)^2 = (x + y)^2 - 4xy$]</p> <p>$x = \frac{80 + 20}{2} = \frac{100}{2} = 50$, $y = \frac{80 - 20}{2} = \frac{60}{2} = 30$</p>	1 1 1 1	5
23	<p>For drawing triangle.</p> <p>For drawing perpendicular bisector of the sides of the triangle.</p> <p>For completing the circumcircle.</p>	1 2 2	5

24	<p>a) $\frac{-2 + 10}{2} = \frac{8}{2} = 4$</p> <p>b) $10 - (-2) = 12$</p> <p>c) 6</p> <p>d) $\frac{3 + (-7)}{2} = \frac{-4}{2} = -2$</p>	1 1 1 2	5
25	<p>a) Height = x , Length = $6 - 2x$, Breadth = $5 - 2x$</p> <p>b) Volume = $x(6 - 2x)(5 - 2x)$ $= 4x^3 - 22x^2 + 30x$</p>	3 1 1	5
26		1 1 1 1 1	5
27	<p>a) Length of a side = $\frac{60}{3} = 20 \text{ cm}$</p> <p>b) Area = $\frac{\sqrt{3} \times 20^2}{4} = 100\sqrt{3} \text{ sq. cm}$</p> <p>c) Length of a side = 20 cm</p> <p>d) Area = $6 \times 100\sqrt{3} = 600\sqrt{3} \text{ sq. cm}$</p>	1 2 1 1	5

28	<p>a) Area of the larger circle = $\pi \times 6^2 = 36\pi \text{ sq. cm}$</p> <p>b) Radii of the smaller circles = $\frac{6}{2}, \frac{6}{3} = 3 \text{ cm}, 2 \text{ cm}$</p> <p>Areas of the smaller circles = $\pi \times 3^2, \pi \times 2^2$ = $9\pi \text{ sq. cm}, 4\pi \text{ sq. cm}$</p> <p>c) Area of the shaded region = Area of the larger circle - Sum of the areas of the smaller circles = $36\pi - (9\pi + 4\pi) = 23\pi \text{ sq. cm}$</p>	1 1 2 1	5
29	<p>a) $1 + 2 + 3 + 4 + 5 + 4 + 3 + 2 + 1 = 5^2 = 5 \times 4 + 5$</p> <p>b) $10^2 = 100$</p> <p>c) 25</p> <p>d) n^2</p> <p>e) $(n + 1)n$</p>	1 1 1 1 1	5