



**BK BIRLA CENTRE FOR EDUCATION**  
SARALA BIRLA GROUP OF SCHOOLS  
SENIOR SECONDARY|CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL  
**MID TERM EXAMINATION , 2024**



Class : IX  
Date :14-09-2024

**MATHEMATICS (041)**

**MARKING SCHEME**

Duration : **3 Hrs**  
Max. Marks : **80**

**SECTION A**

**Each question carries 1 mark. ( mcq)**

1. Always irrational [C]
2.  $\frac{1}{3}$  [D]
3.  $\sqrt{3}cm^2$  [B]
4.  $60 cm^2$  [C]
5. 4, -2 [B]
6. 4 [B]
7. Linear [C]
8. Equal [B]
9.  $55^0$  [B]
10.  $36^0, 54^0, 90^0$  [A]
11. Third quadrant [C]
12. -1 [D]
13.  $\frac{1}{2}$  [B]
14. Infinitely many [C]
15.  $x - 2y - 10 = 0$  [A]
16.  $3\pi r^2$  [D]
17. 1 : 4 [C]
18.  $5544 cm^2$  [C]
19. [A]
20. [A]

**SECTION B**

21.  $2^{2/3} \times 2^{1/3} = 2^{2/3+1/3}$  1  
 $= 2^{3/3}$  1  
 $= 2$
22.  $(4a)^2 + (-2b)^2 + (-3c)^2 + 2 \times 4a \times (-2b) + 2(-2b)(-3c) + 2(-3c)(4a)$  1  
 $16a^2 + 4b^2 + 9c^2 - 16ab + 12bc - 24ca$  1
- OR
- $(104)^2 = (100 + 4)^2$  1  
 $= 100^2 + 2 \times 100 \times 4 + 4^2$   $\frac{1}{2}$   
 $= 10816$   $\frac{1}{2}$
23.  $2x + 3x = 90$   $\frac{1}{2}$

$$x = 18$$

$$a = 36^0, b = 54^0 \quad \frac{1}{2}$$

$$c = 180 - 54 \quad \frac{1}{2}$$

$$c = 126^0 \quad \frac{1}{2}$$

24.  $2x + 3y = k$

$$2(5) + 3(-1) = k \quad \frac{1}{2}$$

$$10 - 3 = k \quad 1$$

$$7 = k \quad \frac{1}{2}$$

25. S.A. of a sphere =  $4\pi r^2$   $\frac{1}{2}$

$$154 = 4 \times \frac{22}{7} r^2 \quad \frac{1}{2}$$

$$r^2 = \frac{154 \times 7}{4 \times 22} \quad \frac{1}{2}$$

$$r = \frac{7}{2} \quad \frac{1}{2}$$

OR

Volume of a Cone =  $\frac{3.14 \times 5 \times 5 \times 12}{3}$   $1$

$$= 3.14 \times 100 \quad \frac{1}{2}$$

$$= 314 \text{ cm}^3 \quad \frac{1}{2}$$

### SECTION C

26.  $\frac{5+\sqrt{6}}{5-\sqrt{6}} \times \frac{5+\sqrt{6}}{5+\sqrt{6}} = \frac{(5+\sqrt{6})^2}{(5)^2 - (\sqrt{6})^2}$   $1$

$$= \frac{25+10\sqrt{6}+6}{25-6} \quad 1$$

$$= \frac{31+10\sqrt{6}}{19} \quad 1$$

27. Semi perimeter =  $\frac{13+13+24}{2}$   $\frac{1}{2}$

$$= 25 \text{ cm} \quad \frac{1}{2}$$

Area =  $\sqrt{s(s-a)(s-b)(s-c)}$

$$= \sqrt{25 \times 12 \times 12 \times 1} \quad 1$$

$$= 5 \times 12 \quad \frac{1}{2}$$

$$= 60 \text{ cm}^2 \quad \frac{1}{2}$$

28.  $6x^2 + 5x - 6 = 6x^2 + 9x - 4x - 6$   $1$

$$= 3x(2x+3) - 2(x+3) \quad 1$$

$$= (3x-2)(x+3) \quad 1$$

OR

i)  $(x + \frac{y}{10})(x - \frac{y}{10})$   $1 \frac{1}{2}$

ii)  $(\frac{5}{4} + \frac{y}{3})(\frac{5}{4} - \frac{y}{3})$   $1 \frac{1}{2}$

29.  $\angle AGE = \angle GED$  alternate angles  $\frac{1}{2}$

$$\angle AGE = 126^0 \quad \frac{1}{2}$$

$$\angle GED = \angle GEF + \angle FED \quad \frac{1}{2}$$

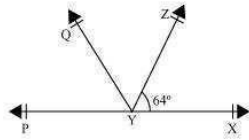
$$126 - 90 = \angle GEF \quad \frac{1}{2}$$

$$36^\circ = \angle GEF$$

$$\angle FGE = 180 - 126 \quad \text{linear pair} \quad \frac{1}{2}$$

$$= 54^\circ \quad \frac{1}{2}$$

**OR**



$$\angle XYZ + \angle ZYP = 180^\circ \quad \frac{1}{2}$$

$$\angle ZYP = 180 - 64 \quad \frac{1}{2}$$

$$\angle ZYP = 116^\circ$$

$$\angle ZYQ = \angle QYP = \frac{116}{2} \quad \frac{1}{2}$$

$$= 58^\circ$$

$$\angle XYQ = 65 + 58 \quad \frac{1}{2}$$

$$= 122^\circ \quad \frac{1}{2}$$

$$\text{Reflex } \angle QYP = 360 - 58$$

$$= 302^\circ \quad \frac{1}{2}$$

30.  $(-2, 4)$  – second quadrant .  $(3, -1)$  – Fourth quadrant. 1
- $(4, 4)$  – First quadrant.  $(-1, 0)$  on x – axis. 1
- $(-1, -1)$  – Third quadrant.  $(0, 10)$  – on y axis. 1

31.  $y = 12 - 2x$

$x$	0	1	2	-1	3	4
$y$	12	10	8	14	6	4

**SECTION D**

32. Semi perimeter =  $\frac{250}{2}$  1
- $$= 125 \text{ cm} \quad \frac{1}{2}$$
- $$\text{Area} = \sqrt{125 \times 5 \times 45 \times 75} \quad 1$$
- $$= \sqrt{25 \times 5 \times 5 \times 9 \times 5 \times 25 \times 3} \quad 1$$
- $$= 25 \times 5 \times 3 \sqrt{15} \quad \frac{1}{2}$$
- $$= 225 \sqrt{15} \text{ cm}^2 \quad \frac{1}{2}$$
33.  $x = 180 - 120$  1  $\frac{1}{2}$
- $$= 60^\circ \quad \frac{1}{2}$$
- $$y = 180 - 140^\circ \quad 1 \frac{1}{2}$$
- $$= 40^\circ \quad \frac{1}{2}$$
- $$z = 60 \text{ vertically opposite angles} \quad \frac{1}{2}$$
- $$a = 80^\circ \quad \frac{1}{2}$$
34. For correct solutions 2

For correct graph	3
<b>OR</b>	
For correct plotting the figure.	3
Name of the figure.	1
Coordinates of the figure	1
<b>35.</b> Volume of the cone = $\frac{\pi r^2 h}{3}$	
$9856 \times 3 = 22 \times 2 \times 14 \times h$	1
$\frac{9856 \times 3}{22 \times 2 \times 14} = h$	1
$48 \text{ cm} = h$	1
Slant height = $\sqrt{(48)^2 + (14)^2}$	$\frac{1}{2}$
$= \sqrt{2500}$	1
$= 50 \text{ cm}$	$\frac{1}{2}$
<b>OR</b>	
Let the radius of the earth be r.	$\frac{1}{2}$
$\therefore$ Radius of the moon = $\frac{r}{4}$	$\frac{1}{2}$
Surface area of the earth = $4\pi r^2$	$\frac{1}{2}$
and surface area of the moon = $4\pi \left(\frac{r}{4}\right)^2$	
$\therefore \frac{\text{Surface area of the moon}}{\text{Surface area of the earth}} = \frac{4\pi \left(\frac{r}{4}\right)^2}{4\pi r^2}$	
$= \frac{\left(\frac{r}{4}\right)^2}{r^2} = \frac{r^2}{16r^2} = \frac{1}{16}$	$\frac{1}{2}$
Thus, the required ratio = 1: 16.	$\frac{1}{2}$
<b>36.</b> i) Semi perimeter ( S) = $\frac{3a}{2}$	1
ii ) Each side = $\frac{180}{3} = 60 \text{ cm}$	2
iii) Area = $\frac{\sqrt{3}}{4} (\text{side})^2$	1
<b>37.</b> i) ( 3 , 4 )	2
ii) x - axis	1
iv) -3	1
<b>38.</b> Slant height = $\sqrt{8^2 + 6^2}$	1
$= \sqrt{100}$	
$= 10 \text{ m}$	
ii) CSA = $3.14 \times 6 \times 10$	2
$= 188.4 \text{ cm}^2$	
iii) Volume = $\frac{1}{3} \pi r^2 h$	1.

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