

M.M. Hr. Sec. School, Thirunagur,

STD: 10.

Madurai-6.

SUB: MATHEMATICS.

- Answer Key -

I. Choose the best answer:

1. b) 2
2. b) $2-4x$.
3. c) 3.
4. a) 1.
5. b) $(y+\frac{1}{y})^2$
6. d) 1
7. a) straight line
8. b) 70°
9. a) 1.4 cm
10. b) parallel to y-axis.
11. b) $-\sqrt{3}$
12. c) $3x+7y=0$
13. b) $3/2$.
14. c) 33.25.

II. 15) $A = \{3, 5\}, B = \{2, 4\}$

16. $f(g(x)) = g(f(x))$
 $\Rightarrow 3(6x-k)+2 = 6(3x+2)-k$
 $\Rightarrow -10 = 2k$
 $\boxed{-5 = k}$

17. LCM of 1, 2, 3, 4, ... 10
 $= 2520$.

18. $13824 = 2^9 \times 3^3$
 $a=9, b=3$.

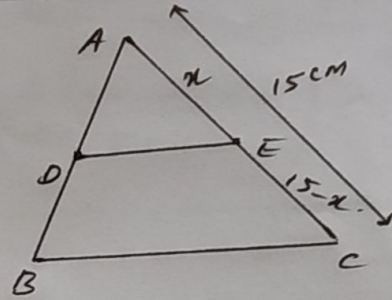
19. $n = \frac{l-a}{d} + 1$
 $= \frac{-54-16}{-5} + 1$
 $\boxed{n=15}$

20. $8p^2+13p+5 = (p+1)(p+5/8)$

Excluded value: $p = -1, -5/8$.

21. $2 \left| \frac{y^4 z^6}{x^2} \right|$

22. By BPT, $\frac{AD}{DB} = \frac{AE}{EC}$
 $\frac{3}{4} = \frac{x}{15-x}$
 $\Rightarrow 4x = 45 - 3x$
 $\Rightarrow 7x = 45$
 $x = 6.43$
 $\therefore AE = 6.43 \text{ cm.}$



23. Area of the $\Delta = 0$ (or) Slope of AB = Slope of BC.

24. Slope = $\frac{y_2 - y_1}{x_2 - x_1} = \frac{\sqrt{5} - 0}{5 - 0} = \frac{1}{\sqrt{5}}$

25. $m = -5/4, (-1, 2)$
 $y - y_1 = m(x - x_1)$
 $y - 2 = -5/4(x + 1)$
 $5x + 4y - 3 = 0.$

26. $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \sqrt{\frac{(1+\sin\theta)(1+\sin\theta)}{(1-\sin\theta)(1+\sin\theta)}} = \frac{1+\sin\theta}{\cos\theta} = \frac{1}{\cos\theta} + \frac{\sin\theta}{\cos\theta}$
 $= \sec\theta + \tan\theta.$

27. Range = $L - S$
 $= 125 - 63$
 $= 62.$

Coefft. of Range = $\frac{L - S}{L + S} = \frac{125 - 63}{125 + 63} = \frac{62}{188} = 0.33$

28. $\frac{1}{p^2 - q^2} = \frac{1}{(p+q)(p-q)}$
 $= \frac{1}{\left(\frac{a}{a+b} + \frac{b}{a+b}\right) \left(\frac{a}{a+b} - \frac{b}{a+b}\right)}$
 $= \frac{1}{(1) \left(\frac{a-b}{a+b}\right)}$
 $= \frac{a+b}{a-b}.$

PART- III

III 29) $f(x) = \frac{x}{2} - 1$

$f(2) = 0$

$f(4) = 1$

$f(6) = 2$

$f(10) = 4$

$f(12) = 5$

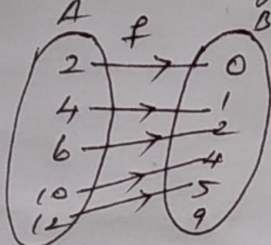
i) set of ordered pairs:

$f = \{(2, 0), (4, 1), (6, 2), (10, 4), (12, 5)\}$

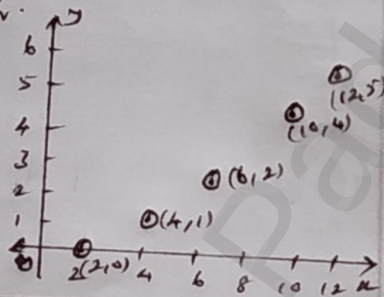
ii) a table

x	2	4	6	10	12
$f(x)$	0	1	2	4	5

iii) an arrow diagram:



iv) a graph:



30) $(f \circ g)(x) = 5 - 4x$

$(f \circ g) \circ h(x) = 5 - 12x$ — (1)

$(g \circ h)(x) = 1 - 6x$

$f \circ (g \circ h)(x) = 5 - 12x$ — (2)

From (1), (2) $(f \circ g) \circ h = f \circ (g \circ h)$

31)

$110 + 121 + \dots + 990$

$n = \frac{l - a}{d} + 1 = \frac{990 - 110}{11} + 1$

$= 81$

$S_n = \frac{n}{2} [a + l] = \frac{81}{2} [110 + 990]$

$= 44550$

32) $10^2 + 11^2 + \dots + 24^2$

$= (1^2 + 2^2 + \dots + 24^2) - (1^2 + 2^2 + \dots + 9^2)$

$= \frac{24 \times 25 \times 49}{6} - \frac{9 \times 10 \times 19}{6}$

$= 4900 - 285$

$= 4615 \text{ cm}^2$

$\sum n^2 = \frac{n(n+1)(2n+1)}{6}$

33) $x + y + z = 5$ — (1)

$2x - y + z = 9$ — (2)

$3x + 2z = 14$

(2) $\times 2$, $4x - 2y + 2z = 18$

$x - 2y + 3z = 16$

$3x - z = 2$

$3x + 2z = 14$

$-3z = -12$

$z = 4$

$x = 2, y = -1$

$\therefore x = 2, y = -1, z = 4$

34)

$m = 30, n = 9$

quotient: $6x^2 - 5x + 3$

35) $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$a = p^2, b = -(p+q)^2$

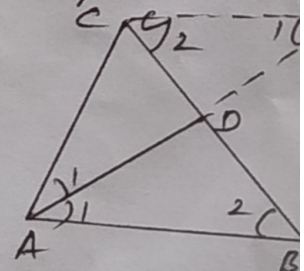
$c = (p+q)^2$

$x = \frac{p+q}{2}, \frac{p+q}{p}$

36) Statement:

The bisector of an angle of a Δ divides the opposite side internally in the ratio of the corresponding sides containing the angle.

$\frac{AB}{AC} = \frac{BD}{CD}$



37) $DE \parallel BC$ in $\triangle ADE, \triangle ABC$

$$\frac{AD}{AB} = \frac{AE}{AC} \quad \text{--- (1) (BPT)}$$

$$\text{In } \triangle AEF, \triangle ADC, \frac{AF}{AD} = \frac{AE}{AC} \quad \text{--- (2)}$$

From (1), (2) $\frac{AD}{AB} = \frac{AF}{AD}$
 $AD^2 = AF \times AB$

38) Area of the Quadrilateral

$$= \frac{1}{2} \begin{vmatrix} x_1 & x_2 & x_3 & x_4 & x_1 \\ y_1 & y_2 & y_3 & y_4 & y_1 \end{vmatrix}$$

$$= \frac{1}{2} [109 + 49]$$

$$= \frac{1}{2} [158] = 79 \text{ Sq. cm}$$

39)

Mid point = (1, -1)

A(-4, 2) B(6, -4)

Slope of

$$AB = -3/5$$

Slope of $\perp$

$$\text{bisector } m = 5/3$$

Eg. of $\perp$ bisector

$$y + 1 = 5/3(x - 1)$$

$$5x - 3y - 8 = 0$$

$$40) \frac{\cos^3 A - \sin^3 A}{\cos A - \sin A} = \frac{(\cos A + \sin A)(\cos^2 A - \cos A \sin A + \sin^2 A)}{\cos A - \sin A}$$

$$= (1 + \cos A \sin A) - (1 - \cos A \sin A)$$

$$= 2 \cos A \sin A$$

$$41) A = 70^\circ$$

$$\sum di = -5, \sum di^2 = 2525$$

$$\sigma = \sqrt{\frac{\sum di^2}{n} - \left(\frac{\sum di}{n}\right)^2}$$

$$= \sqrt{\frac{2525}{7} - \left(-5/7\right)^2}$$

$$= \sqrt{\frac{17650}{49}}$$

$$= 18.98$$

$$42) A(x, 0) B(0, y)$$

$$\text{Mid point of } AB = \left(\frac{x+0}{2}, \frac{0+y}{2}\right) = (x/2, y/2)$$

$$x = 4, y = 6$$

$$\therefore x\text{-intercept } a = 4$$

$$y\text{-intercept } b = 6$$

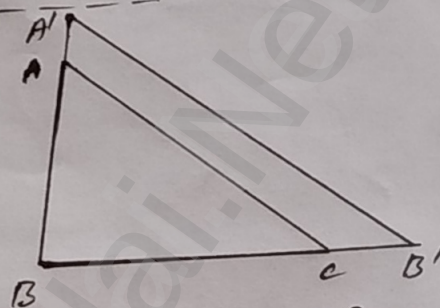
$$\text{Eq. of } AB: \frac{x}{4} + \frac{y}{6} = 1$$

$$6x + 4y - 24 = 0$$

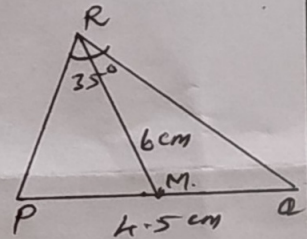
PART- IV

43)

a)



b)



44)

a)

Time (Min)	60	120	180	240
Distance (km)	50	100	150	200

"Direct variation"

$$y = 5/6 x$$

$$\text{i) } K = 5/6$$

$$\text{ii) } 75 \text{ km}$$

$$\text{iii) } 6 \text{ hrs.}$$

$$xy = 24$$

b)

x	1	2	3	4	6	8	2	1
y	24	12	8	6	4	3	12	24

From the graph

$$\text{(i) } x = 3, y = 8$$

$$\text{(ii) } y = 12, x = 2$$

- B. B. B. B. B.

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