

M.M. Hr. Sec. School, Thirunagar,

STD: 10.

Madurai-6.

SUB: MATHEMATICS.

- ANSWER KEY -

I. Choose the best answer:

1. b) 2
2. a) $2-4x$.
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: $p = -1, -5/8$.

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

$$22. \quad \text{By BPT, } \frac{AD}{DB} = \frac{AE}{EC}$$

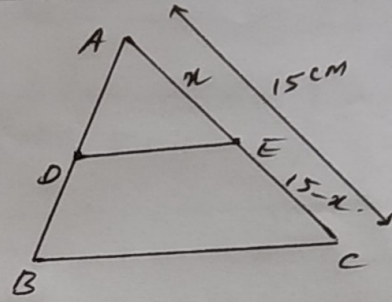
$$\frac{3}{4} = \frac{x}{15-x}$$

$$\Rightarrow 4x = 45 - 3x$$

$$\Rightarrow 7x = 45$$

$$x = 6.43$$

$$\therefore AE = 6.43 \text{ cm.}$$



$$23. \quad \text{Area of the } \Delta = 0 \text{ (or) slope of AB} = \text{slope of BC.}$$

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

$$25. \quad m = -5/4, (-1, 2)$$

$$y - y_1 = m(x - x_1)$$

$$y - 2 = -5/4(x + 1)$$

$$5x + 4y - 3 = 0.$$

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

$$= \sec \theta + \tan \theta.$$

$$27. \quad \text{Range} = L - S$$

$$= 125 - 63$$

$$= 62.$$

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

$$28. \quad \frac{1}{p^2 - q^2} = \frac{1}{(p+q)(p-q)}$$

$$= \frac{1}{\left(\frac{a}{a+b} + \frac{b}{a+b}\right) \left(\frac{a}{a+b} - \frac{b}{a+b}\right)}$$

$$= \frac{1}{(1) \left(\frac{a-b}{a+b}\right)}$$

$$= \frac{a+b}{a-b}.$$

PART- III

III 29) $f(x) = \frac{x}{2} - 1$
 $f(2) = 0$
 $f(4) = 1$
 $f(6) = 2$
 $f(10) = 4$
 $f(12) = 5$

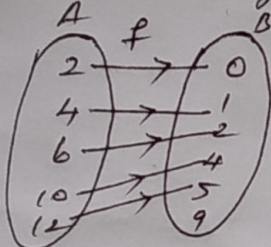
i) set of ordered pairs:

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

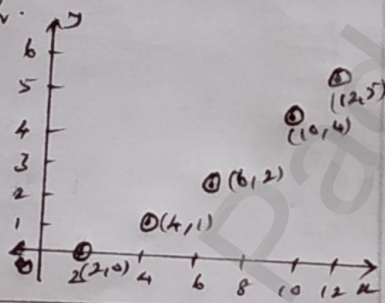
ii) a table

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) $110 + 121 + \dots + 990$
 $n = \frac{l - a}{d} + 1 = \frac{990 - 110}{11} + 1$
 $= 81$
 $S_n = \frac{n}{2} [a + l] = \frac{81}{2} [110 + 990]$

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)
 $3x + 2z = 14$
 (1) $\times 2$, $4x - 2y + 2z = 10$
 $x - 2y + 3z = 16$
 $3x - z = 2$
 $3x + 2z = 14$
 $-3z = -12$
 $z = 4$
 $x = 2, y = -1$
 $\therefore x = 2, y = -1, z = 4.$

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.

