

HY - 2024 - MATHS - X

1) (b) 2

2) (a) (8, 6)

3) (c) 14280

4) (a) 1

5) (d) 4×3

6) (d) $5\sqrt{2}$ அ.கு.மீ

7) (b) [illegible]

8) (c) 9

9) (b) 1

10) (c) 2

11) (c) 3π

12) (c) 4

13) (a) 0

14) (c) 1.05

2 MARKS

15) $B = \{1, 3, 7\}$

16) $(a-2)\,0(a^2-1) = 1$
$a^2 - 3 = 1$
$a^2 = 4$
$\boxed{a = \pm 2}$

17) $3^3 \times 5^2 \times 2^4 \times 7^1 = p^3 \times q^2 \times r^4 \times s^1$
$p = 3,\ q = 5$
$r = 2,\ s = 7$

18) $n^2 + n - 1332 = 0$
$(n+37)(n-36) = 0$
$\therefore \boxed{n = 36}$

19) $2\left|\dfrac{y^4 z^6}{x^2}\right|$

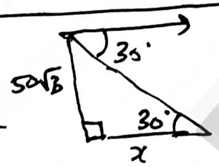
20) $A^T = \begin{bmatrix} 5 & \sqrt{17} & 8 \\ 2 & 0.7 & 3 \\ 2 & 5/2 & 1 \end{bmatrix}$

21) $\dfrac{AB}{AC} = \dfrac{BD}{DC}$
$\dfrac{6}{AC} = \dfrac{4}{3} \Rightarrow \boxed{AC = 4.5}$

22) $m = \dfrac{0-\sqrt{5}}{0-5} = \dfrac{1}{\sqrt{5}}$

23) $\left(\dfrac{-5}{-2}\right) \times \left(\dfrac{-2}{a}\right) = -1$
$\boxed{a = +5}$

24) $\sqrt{\dfrac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$

25)


$\tan 30° = \dfrac{50\sqrt{3}}{x}$
$\dfrac{1}{\sqrt{3}} = \dfrac{50\sqrt{3}}{x}$
$\therefore \boxed{x = 150\text{ மீ}}$

26) $\pi r(l+r) = 704$
$\pi \times 7 \times (l+7) = 704$
$\therefore \boxed{l = 25\text{ செ.மீ}}$

27) வீச்சு $= 67 - 18 = 49$
வீச்சுக் கெழு $= \dfrac{49}{85}$

28) $P(A) = \dfrac{2}{7}$

5 MARKS

29) $A = \{0, 1, 2\}$
$B = \{2, 3, 4, 5\}$
$C = \{3, 5, 7\}$
$B \cup C = \{2, 3, 4, 5, 7\}$
$A \times (B \cup C) = \{(0,2), (0,3), (0,4), (0,5), (0,7), (1,2), (1,3), (1,4), (1,5), (1,7), (2,0), (2,3), (2,4), (2,5), (2,7)\}$

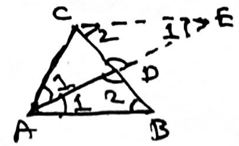
30) $R = \{0, 1, 2, 4, 5\}$

31) $a + 6d = -1$
$a + 15d = 17$
$\boxed{a = -13}\ \boxed{d = 2}$
$\therefore t_n = 2n - 15$

32) $S_n = \dfrac{5}{9}\left[\dfrac{10(10^n - 1)}{9} - n\right]$

33) $\dfrac{1}{A+B} = \dfrac{1}{\dfrac{2x+1}{2x-1} + \dfrac{2x-1}{2x+1}}$
$= \dfrac{2(4x^2+1)}{4x^2-1}$

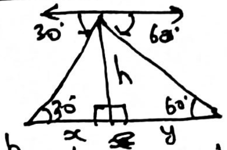
34) $A^2 = \begin{pmatrix} \cos^2\theta & 0 \\ 0 & \cos^2\theta \end{pmatrix}$
$B^2 = \begin{pmatrix} \sin^2\theta & 0 \\ 0 & \sin^2\theta \end{pmatrix}$
$\therefore A^2 + B^2 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} = I$

35) ABT


$\angle ABC = \angle BAE = \angle 1$
$\boxed{AC = CE}$
$\triangle ABD \sim \triangle ECD$
$\dfrac{AB}{CE} = \dfrac{BD}{CD} \Rightarrow \boxed{\dfrac{AB}{AC} = \dfrac{BD}{CD}}$

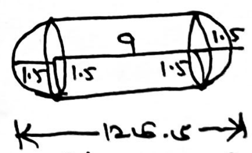
36) $\bar{x} = \dfrac{1}{2}[88 + 60 - 15 - 24 - 30 + 55 + 48 - 24]$
$= \dfrac{158}{2} = 79$ ச.அ.

37) $m_1 = \dfrac{-3-7}{2-6} = \dfrac{5}{2}$
$\therefore \boxed{m = \dfrac{-2}{5}}$ $(x_1, y_1) = (6, -2)$
$y - (-2) = \dfrac{-2}{5}(x - 6)$
$\boxed{2x + 5y - 2 = 0}$

38)


$\tan 30° = \dfrac{h}{x}$ | $\tan 60° = \dfrac{h}{y}$
$\boxed{x = \sqrt{3}h}$ | $\boxed{y = \dfrac{h}{\sqrt{3}}}$
$\therefore x + y = \sqrt{3}h + \dfrac{h}{\sqrt{3}} = \dfrac{4h}{\sqrt{3}}$ மீ.

39) $V = \dfrac{\pi \times 45}{3}[28^2 + 7^2 + 28 \times 7]$
$= 48510$ க.செ.மீ.

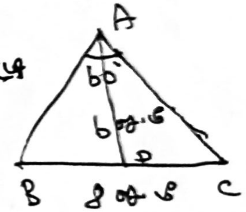
40)


$\therefore V = \pi r^2 h + \dfrac{4}{3}\pi r^3$
$= \pi r^2\left[h + \dfrac{4r}{3}\right]$
$= \dfrac{22}{7} \times \dfrac{3}{2} \times \dfrac{3}{2} \times \left[9 + \dfrac{4 \times 3}{3 \times 2}\right]$
$= 77.78$ செ.மீ^{3}

41) $\bar{x} = \dfrac{483}{7} = 69$
$\sigma = \sqrt{\dfrac{\Sigma d^2}{n}} = \sqrt{\dfrac{2422}{7}}$
$= \sqrt{346}$
$\boxed{\sigma = 18.6}$

42) $P(A \cup B) = \dfrac{6}{36} + \dfrac{3}{36} - \dfrac{1}{36}$
$= \dfrac{8}{36}$
$= \dfrac{2}{9}$

8 MARKS

43.a)


63.a) 6 செ.மீ

43.b) $PA = PB = 4$ செ.மீ.

44.a) $y = \frac{1}{2}x$
$k = \frac{1}{2}$
(i) $x = 9$ எனில், $y = 4.5$
(ii) $y = 7.5$ எனில், $x = 15$.

44.b) $y = x^2 + 3x - 4$

x	-4	-3	-2	-1	0	1	2	3	4
y	0	-4	-6	-6	-4	0	6	14	35

$x = \{-4, 1\}$