

1. c $(2, -1)$
2. b. (i), (ii), (iv) only.
3. b) 9
4. c) $\frac{x^2 - 7x + 40}{(x^2 - 25)(x + 1)}$
5. b) Rectangular matrix.
6. a) 1.4 cm
7. b) Two
8. b) Parallel to y axis.
9. c) $3x + 7y = 0$
10. a) 2a
11. b) $\frac{b}{3}$
12. a) 12 cm
13. a) $P(A) > 1$
14. d) 225

அ. ரவிச்சந்திரன், எம்.எஸ்.பி.எல். எம்.பி.எல்.
கணித பட்டதாரி ஆசிரியர்
அரசு மேல்நிலைப்பள்ளி,
புலம்பட்டி-621 215, தொழியம் வட்டம்.
திருச்சி மாவட்டம்.

$$20. \frac{AD}{DB} = \frac{AE}{EC}$$

$$\frac{x}{x-2} = \frac{x+2}{x-1}$$

$$x^2 - x = x^2 - 4$$

$$\boxed{x = 4}$$

$\therefore AD = 4 ; DB = 2 ; AE = 6$
 $EC = 3$
 $\therefore AB = 6 ; AC = 9$.

$$21. \text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 1}{-3 - 6} = \frac{1}{3}$$

$$22. \sin 2\theta - \cos \theta = \frac{1}{\cos \theta} - \cos \theta$$

$$= \frac{1 - \cos^2 \theta}{\cos \theta}$$

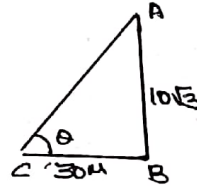
$$= \frac{\sin^2 \theta}{\cos \theta}$$

$$= \tan \theta \cdot \sin \theta$$

$$23. \tan \theta = \frac{AB}{CB} = \frac{10\sqrt{3}}{30}$$

$$= \frac{1}{\sqrt{3}}$$

$$\tan \theta = \tan 30^\circ$$

$$\boxed{\theta = 30^\circ}$$


$$24. \text{C.S.A of the frustum}$$

$$= \pi(R+r)l \text{ sq. units.}$$

$$= \frac{22}{7} \times 5 \times 5$$

$$= \frac{550}{7} = 78.57 \text{ cm}^2.$$

$$25. \text{Let } r \text{ be radius of the given sph}$$

$$r_1 \rightarrow \text{radius of the new sphere.}$$

$$r_1 = r + (25\%) = r + \frac{1}{4}r = \frac{5r}{4}$$

Surface area of the sph = $4\pi r^2$
Sur. area. of the new sphere = $4\pi \left(\frac{5r}{4}\right)^2$

$$= \frac{25\pi r^2}{4}$$

$$\text{change in S.A} = \frac{25\pi r^2}{4} - 4\pi r^2$$

$$= \frac{9\pi r^2}{4}$$

Percentage of increase = 56.25%

$$15. A = \{3, 5\}$$

$$B = \{2, 4\}$$

$$16. f(-1) = 1 + 5 + 6 = 12$$

$$f(2) = 4 - 10 + 6 = 0$$

$$17. 252525 = 25 \times 10101 = 5 \times 5 \times 10101$$

$$363636 = 36 \times 10101 = 2 \times 2 \times 3 \times 3 \times 10101$$

$$\therefore \text{HCF}(252525, 363636) = 10101.$$

Any other method give mark.

$$18. S_{\infty} = \frac{a}{1-r} = \frac{3}{1-\frac{1}{3}} = \frac{9}{2}$$

$$19. AB = \begin{pmatrix} 1 & -1 & 1 & -1 \\ -1 & 1 & -1 & 1 \end{pmatrix}$$

$$= \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$$

$$= 0$$

26.

$$\begin{aligned}
 3.0, 5 &= \sqrt{\frac{10^2-1}{12}} = \sqrt{\frac{21^2-1}{12}} \\
 &= \sqrt{\frac{441-1}{12}} \\
 &= \sqrt{\frac{440}{12}} \\
 &= \sqrt{36.66} \\
 &= 6.054 \\
 &= 6.05
 \end{aligned}$$

27.

$$S = \{HHH, HHT, HTH, HTT, THH, THT, TTH, TTT\}$$

$$n(S) = 8.$$

$$A = \{HTT, TTH, TTT\}$$

$$n(A) = 3$$

$$P(A) = \frac{3}{8}$$

28.

$$\theta = 30 \Rightarrow \tan \theta = \tan 30^\circ$$

$$m = \frac{1}{\sqrt{3}}$$

$$c = -3.$$

Required eqn is

$$y = mx + c$$

$$y = \frac{1}{\sqrt{3}}x - 3.$$

$$\sqrt{3}y = x - 3\sqrt{3}$$

$$x - \sqrt{3}y - 3\sqrt{3} = 0.$$

30.

$$f(2) = \frac{2}{2} - 1 = 0$$

$$f(4) = \frac{4}{2} - 1 = 1$$

$$f(6) = \frac{6}{2} - 1 = 2.$$

$$f(10) = \frac{10}{2} - 1 = 4$$

$$f(12) = \frac{12}{2} - 1 = 5$$

i) set of ordered pairs:

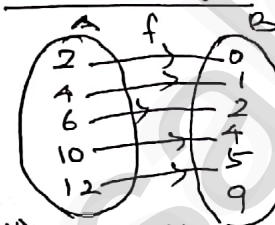
$$f = \{(2,0), (4,1), (6,2), (10,4), (12,5)\}$$

cii) a table:

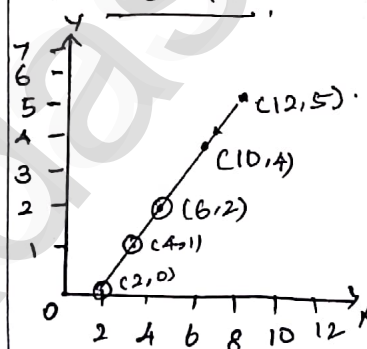
x	2	4	6	10	12
f(x)	0	1	2	4	5

(ii)

an arrow diagram:



iv) a graph:



III

$$29. A = \{2, 3\}; B = \{0, 1\}; C = \{1, 2\}$$

$$B \cap C = \{1\}$$

$$A \times (B \cap C) = \{(2,1), (3,1)\} \text{ --- (1)}$$

$$A \times B = \{(2,0), (2,1), (3,0), (3,1)\}$$

$$A \times C = \{(2,1), (2,2), (3,1), (3,2)\}$$

$$(A \times B) \cap (A \times C) = \{(2,1), (3,1)\} \text{ --- (2)}$$

from (1) & (2)

$$A \times (B \cap C) = (A \times B) \cap (A \times C).$$

30.

$$t_{13} = a + 12d = 3 \text{ --- (1)}$$

$$s_{13} = \frac{13}{2} \{2a + 12d\} = 234$$

$$2a + 12d = 36 \text{ --- (2)}$$

$$a = 33; d = -\frac{5}{2}.$$

$$S_{21} = \frac{21}{2} \{2 \times 33 + (21-1) \left(-\frac{5}{2}\right)\}$$

$$= \frac{21}{2} \{66 - 50\}$$

$$= 168.$$

அ. ரவிச்சந்திரன், எம்.எஸ்.சி.பி.எட்.எம்.பில்,
கணித பட்டதாரி ஆசிரியர்
அரசு மேல்நிலைப்பள்ளி,
எண்ப்படி-621 215, தொழியல் வட்டி :
திருச்சி மாவட்டம்.

32. $10^3 + 11^3 + 12^3 + 20^3 -$
 $= (1^3 + 2^3 + \dots + 20^3) - (1^3 + 2^3 + \dots + 9^3)$
 $= \left[\frac{20(21)}{2} \right]^2 - \left[\frac{9(10)}{2} \right]^2$
 $= (210)^2 - (45)^2$
 $= 44100 - 2025$
 $= 42075$

33. $A^2 = \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix} \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}$
 $= \begin{bmatrix} -1 & -4 \\ 8 & 7 \end{bmatrix}$
 $A^2 - 4A + 5I_2 =$
 $= \begin{bmatrix} -1 & -4 \\ 8 & 7 \end{bmatrix} + \begin{bmatrix} -4 & -4 \\ -8 & -12 \end{bmatrix}$
 $+ \begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$
 $= \begin{bmatrix} -1 & -4 \\ 8 & 7 \end{bmatrix} + \begin{bmatrix} 1 & 4 \\ -8 & -7 \end{bmatrix}$
 $= \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix} = 0.$

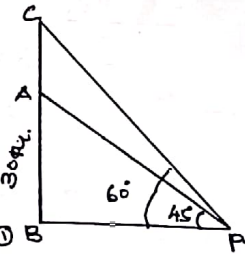
34.
$$\begin{array}{r} 3x^2 + 2x + 4 \\ 3x^2 \overline{) 9x^4 + 12x^3 + 28x^2 + ax + b} \\ \underline{9x^4} \\ 12x^3 + 28x^2 \\ 12x^3 \overline{) 12x^3 + 16x^2} \\ \underline{12x^3 + 16x^2} \\ 24x^2 + ax + b \\ 24x^2 \overline{) 24x^2 + 16x + 16} \\ \underline{24x^2 + 16x + 16} \\ 0 \end{array}$$

 $\therefore a = 16; b = 16.$

தி. பரமசிவன், மெட்ரோபிள. ஸ்ப. பி. பி.
 கல்வித் துறை தனி ஆசிரியர்
 அமைப்பு, சென்னை.
 இணையத்திலும் கிண்பும் வலைப்
 தளங்களில்.

35. $\frac{1}{2} \begin{Bmatrix} -4 & -3 & 3 & 2 & -4 \\ -2 & k & -2 & 3 & -2 \end{Bmatrix} = 28$
 $(-4k + 6 + 9 - 4) - (6 + 3k - 4 - 12)$
 $= 56$
 $-4k + 11 - 3k + 10 = 56$
 $-7k = 56 - 21$
 $k = \frac{35}{-7}$
 $k = -5$

36. Intercept form:
 $\frac{x}{a} + \frac{y}{b} = 1$
 Qn: x intercept = a
 y intercept = a.
 $\therefore \frac{x}{a} + \frac{y}{a} = 1$
 $\Rightarrow x + y = a \quad \text{--- (1)}$
 $\textcircled{1} \rightarrow (8, -4).$
 $-8 + 4 = a$
 $a = -4.$
 \therefore Required eq. is.
 $x + y = -4$
 $x + y + 4 = 0$

37. In $\triangle CBP$, $\angle CPB = 60^\circ$
 $\tan \theta = \frac{BC}{BP}$
 $\tan 60^\circ = \frac{30 + AC}{BP}$
 $\sqrt{3} = \frac{30 + AC}{BP}$

 In right $\triangle ABP$, $\angle APB = 45^\circ$
 $\tan \theta = \frac{AB}{BP}$
 $\tan 45^\circ = \frac{AB}{BP}$
 $1 = \frac{30}{BP}$
 $BP = 30$
 $\textcircled{1} \Rightarrow \sqrt{3} = \frac{30 + AC}{30} = \sqrt{3}$
 $30 + AC = 30\sqrt{3}$
 $A = 30\sqrt{3} - 30$
 $= 30(0.732)$
 $= 21.96$
 Height of the tower = 21.96m.

38. Vol. of frustum = $\frac{1}{3} \pi h (R^2 + Rr + r^2)$
 Cea. units
 $= \frac{1}{3} \times \frac{22}{7} \times 16 [20^2 + 20(8) + 8^2]$
 $= \frac{22 \times 16}{21} [400 + 160 + 64]$
 $= \frac{22 \times 16}{21} \times 624$
 $= \frac{352 \times 624}{21}$
 $= 10459.42 \text{ cm}^3$
 $= \frac{10459.42}{1000} \text{ l.}$
 $= 10.45942 \text{ l.}$
 $= 10.459 \text{ l.}$

Cost of milk = ₹ = 40

∴ Total cost = 10.459×40
 $= ₹ 418.36$

39. statement : 2 Mark.
 Given, T.P.T, construction : 1
 Proof : 2 marks.

40. Mean $\bar{x} = \frac{12+15+18+20+25}{5}$
 $= \frac{90}{5}$
 $\bar{x} = 18$

x	$d = x - \bar{x}$	d^2
12	-6	36
15	-3	9
18	0	0
20	2	4
25	7	49
		$\sum d^2 = 98$

S.D, $\sigma = \sqrt{\frac{\sum d^2}{n}} = \sqrt{\frac{98}{5}} = \sqrt{19.6}$
 $= 4.427$
 $= 4.43$

C.V = $\frac{\sigma}{\bar{x}} \times 100\%$

Kindly Send Me Your Key Answer to Our email id - Padasalai.net@gmail.com

$$= \frac{4.43}{18} \times 100$$

$$= \frac{443}{18} = 24.61$$

$$\boxed{C.V = 24.61}$$

41.

$$S = \{(1,1), \dots, (6,6)\}$$

$$n(S) = 36$$

$$A = \{(1,3), (2,2), (3,1)\}$$

$$n(A) = 3$$

$$P(A) = \frac{3}{36}$$

$$= \frac{1}{12}$$

42.

Sphere

Small sphere.

$$r = 16 \text{ cm}$$

$$r_1 = 2 \text{ cm}$$

$$\text{No. of small sphere} = \frac{\text{Vol. of a sph.}}{\text{Vol. of a small sph.}}$$

$$= \frac{\frac{4}{3} \pi r^3}{\frac{4}{3} \pi r_1^3}$$

$$= \frac{16^3}{2^3}$$

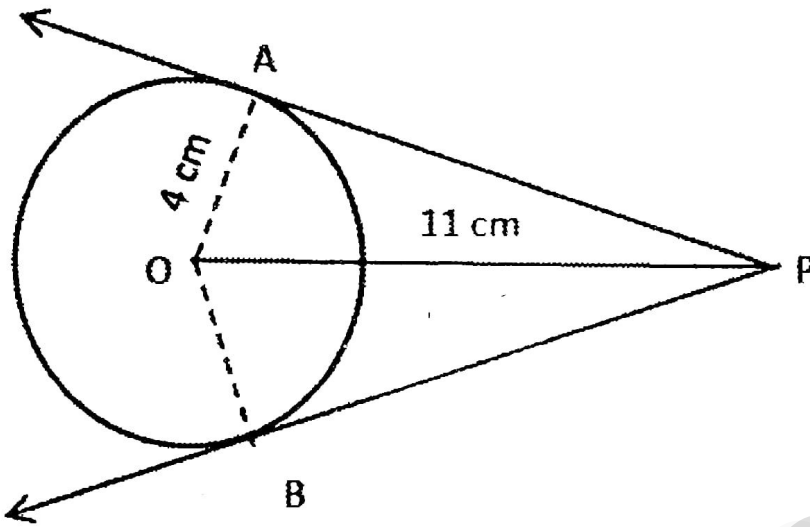
$$= 8^3$$

$$= 512$$

$$\therefore \text{Number of sphere} = 512$$

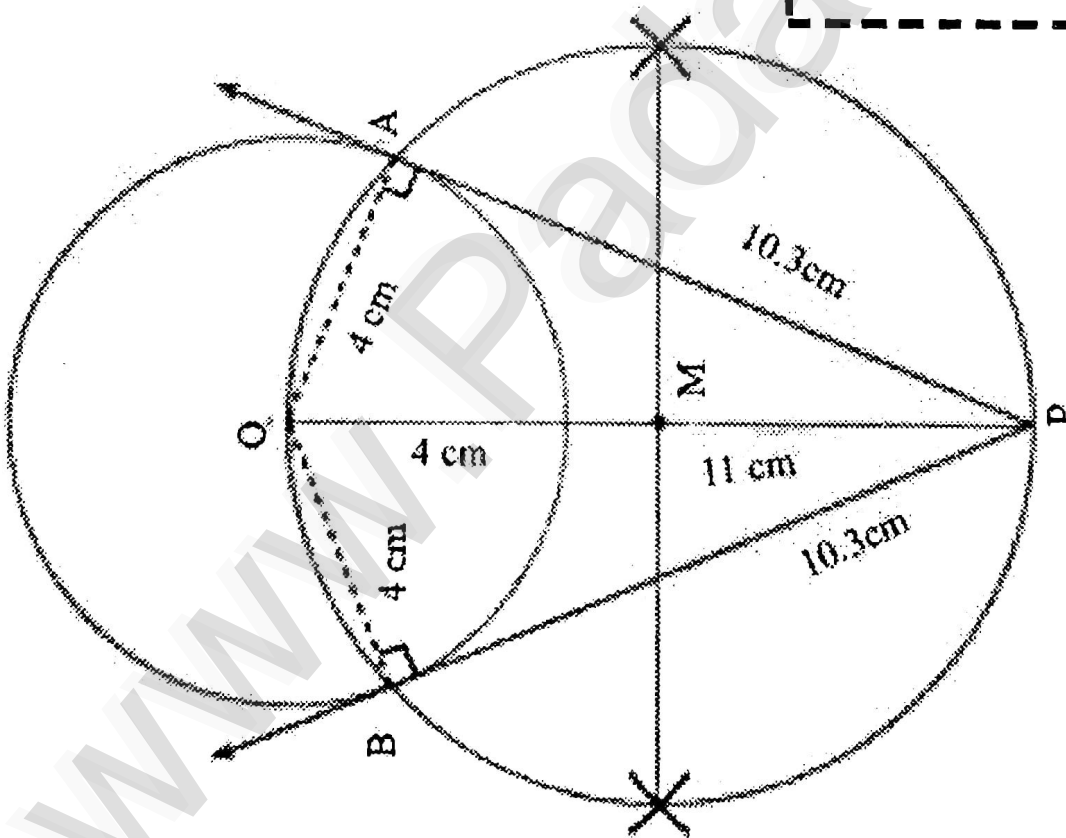
அ. ரவிச்சந்திரன், எம்.எஸ்.சி.எட்.எம்.பி.ஃ.
 கணித பட்டதாரி ஆசிரியர்
 அரசு மேல்நிலைப்பள்ளி.
 ஏலாம்பட்டி-621 215, தொண்டி வட்டம்.
 திருச்சி மாவட்டம்.

Take a point which is 11cm away from the centre of a circle of radius 4cm and draw the two tangents to the circle from the point.



Verification

$$\begin{aligned}
 AP &= \sqrt{OP^2 - OA^2} \\
 &= \sqrt{11^2 - 4^2} \\
 &= \sqrt{121 - 16} \\
 &= \sqrt{105} \\
 &= 10.3 \text{ cm}
 \end{aligned}$$



Length of tangents = 10.3 cm

Graph the following linear function $y = \frac{1}{2}x$

- x. Identify the constant of variation and verify it with the graph. Also (i) find y when $x = 9$.
(ii) find x when $y = 7.5$

1. Table

X	2	4	6	8	10
y	1	2	3	4	5

2. Variation - Direct Variation

3. Equation:

$$\Rightarrow y = kx \quad \Rightarrow k = \frac{y}{x}$$

$$\Rightarrow k = \frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10}$$

$$\dots\dots\dots = \frac{1}{2}$$

$$\Rightarrow y = \frac{1}{2}x$$

4. Points: (2, 1), (4, 2), (6, 3), (8, 4), (10, 5)

5. Solution:

From the graph

(i) If $x = 9$ then, $y = 4.5$

(ii) If $y = 7.4$ then $x = 15$

