LIBERTY PAPER SET

STD. 10 : Mathematics (Standard) [N-012(E)]

Full Solution

Time : 3 Hours **ASSIGNTMENT PAPER 8**

Section-A

1. (D) – 4 **2.** (B) 4 **3.** (B) 12 **4.** (D) 12 **5.** (C) 16 : 9 **6.** (C) 3 **7.** 1610 **8.** 5 **9.** $x + y + 15$ **10.** Euclid **11.** – 8 **12.** 6 **13.** False **14.** True **15.** True **16.** False **17.** Downward open pasabola **18.** $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ **19.** 81 **20.** 128 **21.** (c) $-\frac{b}{a}$ **22.** (a) $\frac{c}{a}$ **23.** (b) 1 **24.** (c) Not defined

Section-B

25. Let us assume that $\sqrt{7}$ is rational.

$\therefore \sqrt{7} = \frac{a}{b}$, (where, a and b are coprime number and a and b have a common factor other than 1.)

$\therefore (\sqrt{7})^2 = \left(\frac{a}{b}\right)^2$

$\therefore 7 = \frac{a^2}{b^2}$

$\therefore a^2 = 7b^2$ ...(1)

Thus, 7 is a factor of a^2

But since 7 is prime number, according to the theorem 1.3, 7 is also a factor of a

Suppose, $a = 7c$ where, c is an integer

$\therefore (a)^2 = (7c)^2$

$\therefore a^2 = 49c^2$

$\therefore 7b^2 = 49c^2$ [As per eq^n (1) $a^2 = 7b^2$]

$\therefore b^2 = 7c^2$

Thus, 7 is a factor of b^2

But since 7 is a prime number, According to the theorem 1.3, 7 is also factor of b.

Therefore, a and b have a common factor other than 1.

Hence, a and b are not prime number.

So, we assumption is wrong.

So, we conclude that $\sqrt{7}$ is irrational.

26. $2x + 3y = 46$ ...(1)

$3x + 5y = 74$ ...(2)

Multiply eq. (1) by 3 & eq^n (2) by 2 and subtract them,

$6x + 9y = 138$

$6x + 10y = 148$

$-\quad -\quad\quad -$

$\therefore -y = -10$

$\therefore y = 10$

Put $y = 10$ in (1),

$2x + 3y = 46$

$\therefore \quad 2x + 3(10) = 46$

$\therefore \quad 2x + 30 = 46$

$\therefore \quad 2x = 46 - 30$

$\therefore \quad 2x = 16$

$\therefore \quad x = \frac{16}{2}$

$\therefore \quad x = 8$

$x = 8, y = 10$

27. Suppose, The first odd positive integers is x and the second consecutive odd pair of positive integer is $(x + 2)$

$\therefore (x)^2 + (x + 2)^2 = 650$

$\therefore x^2 + x^2 + 4x + 4 - 650 = 0$

$\therefore 2x^2 + 4x - 646 = 0$

$\therefore x^2 + 2x - 323 = 0$

$\therefore x^2 + 19x - 17x - 323 = 0$

$\therefore x(x + 19) - 17(x + 19) = 0$

$\therefore (x + 19)(x - 17) = 0$

$\therefore x + 19 = 0$ or $x - 17 = 0$

$\therefore x = -19$ or $x = 17$

But $x = -19$ is not possible because it is not a positive integer.

$\therefore x = 17$

Thus, the desired two consecutive pair of positive integers are 17 and 19.

28. $2x^2 + x - 6 = 0$

$\therefore 2x^2 + 4x - 3x - 6 = 0$

$\therefore 2x(x + 2) - 3(x + 2) = 0$

$\therefore (2x - 3)(x + 2) = 0$

$\therefore 2x - 3 = 0$ OR $x + 2 = 0$

$\therefore 2x = 3$ OR $x = -2$

$x = \frac{3}{2}$

$\therefore$ The roots of this equation : $-2, \frac{3}{2}$

29. Here, $a = 16$, $d = 6 - 16 = -10$, $n = 30$

$S_n = \frac{n}{2}[2a + (n - 1)d]$

$\therefore \quad S_{30} = \frac{30}{2}[2(16) + (30 - 1)(-10)]$

$\therefore \quad S_{30} = 15[32 + 29(-10)]$

$\therefore \quad S_{30} = 15(32 - 290)$

$\therefore \quad S_{30} = 15(-258)$

$S_{30} = -3870$

So, the sum of first 30 terms will be -3870.

30. $4(\sin^4 30° + \cos^4 60°) - \frac{2}{3}(\sin^2 60° - \cos^2 45°) + \frac{1}{2}\tan^2 60°$

$= 4\left\{\left(\frac{1}{2}\right)^4 + \left(\frac{1}{2}\right)^4\right\} - \frac{2}{3}\left\{\left(\frac{\sqrt{3}}{2}\right)^2 - \left(\frac{1}{\sqrt{2}}\right)^2\right\} + \frac{1}{2}(\sqrt{3})^2$

$= 4\left(\frac{1}{16} + \frac{1}{16}\right) - \frac{2}{3}\left(\frac{3}{4} - \frac{1}{2}\right) + \frac{1}{2}(3)$

$= 4 \times \left(\frac{1+1}{16}\right) - \frac{2}{3}\left(\frac{3-2}{4}\right) + \frac{3}{2}$

$= 4 \times \frac{2}{16} - \frac{2}{3} \times \frac{1}{4} + \frac{3}{2}$

$= \frac{1}{2} - \frac{1}{6} + \frac{3}{2}$

$= \frac{3-1+9}{6}$

$= \frac{11}{6}$

31. LHS $= \frac{2\sin\theta \cdot \cos\theta - \cos\theta}{1 - \sin\theta + \sin^2\theta - \cos^2\theta}$

$= \frac{\cos\theta(2\sin\theta - 1)}{1 - \sin\theta + \sin^2\theta - 1 + \sin^2\theta}$

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

$= \frac{\cos\theta(2\sin\theta - 1)}{\sin\theta(2\sin\theta - 1)}$

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

$= \cot\theta$ = RHS

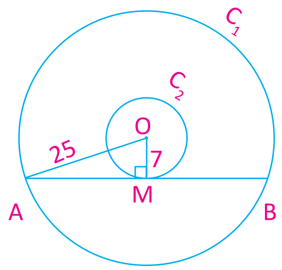
32. The radii of the two O concentric circles are C_1 and C_2.

Radius of $C_1 = r_1$ = OA = 25 cm

Radius of $C_2 = r_2$ = OM = 7 cm

The chord AB of C_1 touches C_2 the point M.

In Δ OMA; ∠M = 90°



$\therefore$ AM $= \sqrt{OA^2 - OM^2}$

$= \sqrt{r_1^2 - r_2^2}$

$= \sqrt{(25)^2 - (7)^2}$

$= \sqrt{625 - 49}$

$= \sqrt{576}$

$\therefore$ AM = 24

But, AB = 2 AM

$\therefore$ AB = 2 × 24

$\therefore$ AB = 48

Thus, the length of the chord is 48 cm.

33. $r = 21$ cm.

Volume of hemisphere $= \frac{2}{3}\pi r^3$

$= \frac{2}{\cancel{3}} \times \frac{22}{\cancel{7}} \times \overset{3}{\cancel{21}} \times 21 \times 21$

$= 44 \times 441$

Volume of hemisphere $= 19{,}404$ cm^3

34. Here $Z + M = 34$ and $M + \bar{x} = 40$

$\therefore Z = 34 - M$ ...(1) and $\bar{x} = 40 - M$ ....(2)

Now, $Z = 3M - 2\bar{x}$

$\therefore 34 - M = 3M - 2(40 - M)$ $(\because$ From (1) & (2))

$\therefore 34 - M = 3M - 80 + 2M$

$\therefore 34 + 80 = 5M + M$

$\therefore 114 = 6M$

$\therefore \frac{114}{6} = M$

$\therefore M = 19$

35.

Life time (in hours)	Frequency (f_i)	x_i	u_i	$f_i u_i$
0 – 200	9	100	–3	–27
200 – 400	35	300	–2	–70
400 – 600	50	500	–1	–50
600 – 800	61	700 = a	0	0
800 – 1000	38	900	1	38
1000 – 1200	32	1100	2	64
Total	$\Sigma f_i = 225$	–	–	$\Sigma f_i u_i = -45$

Mean $\bar{x} = a + \frac{\sum f_i u_i}{\sum f_i} \times h$

$\therefore \bar{x} = 700 + \frac{-45 \times 200}{225}$

$\therefore \bar{x} = 700 - 40$

$\therefore \bar{x} = 660$ hours

36. Here total number of students = 100

(a) Number of students getting more than 40 marks = 2 + 1 = 3

Probability $= \frac{\text{Numbers of Students getting more than 40 marks}}{\text{Total number of students}}$

$= \frac{3}{100}$

$= 0.03$

(b) Number of students getting less than 30 marks = 6 + 20 + 24 + 28 = 78

Probability $= \frac{\text{Numbers of Students getting less than 30 marks}}{\text{Total number of students}}$

$= \frac{78}{100}$

$= 0.78$

37. Possible outcomes in throwing a die = 6

(1, 2, 3, 4, 5, 6)

(i) Suppose A be the event getting an even number on die.

There are 3 even numbers 2, 4 and 6 on a die.

$\therefore$ The number of outcomes favourable to A = 3

$\therefore$ P (A) = $\frac{3}{6} = \frac{1}{2}$

(ii) Suppose B be the event getting a grater than 3 on die.

There are 3 numbers 4, 5 and 6 which grater than 3 among 1 to 6.

$\therefore$ The number of outcomes favourable to B = 3

$\therefore$ P (B) = $\frac{3}{6} = \frac{1}{2}$

Section-C

38. $4y^2 + 8y = 0$

$\therefore$ $4y(y + 2) = 0$

$\therefore$ $4y = 0$ and $y + 2 = 0$

$\therefore$ $y = 0$ and $y = -2$

Sum of the zeroes = $0 - 2 = -2 = -\frac{2 \times 4}{4} = -\frac{8}{4} = -\frac{b}{a} = -\frac{\text{coefficient of } y}{\text{coefficient of } y^2}$

Product of the zeroes = $0 \times (-2) = 0 = \frac{0}{4} = \frac{c}{a} = \frac{\text{constant term}}{\text{coefficient of } y^2}$

39. Lets $P(x) = x^2 - 5x + 6$

Compare with $P(x) = ax^2 + bx + c$

$\therefore$ $a = 1,\ b = -5,\ c = 6$

$\alpha + \beta = \frac{-b}{a} = \frac{-(-5)}{1} = 5$

$\alpha \,.\, \beta = \frac{c}{a} = \frac{6}{1} = 6$

(i) $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha \,.\, \beta}$

$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{5}{6}$

(ii) $\alpha^2 + \beta^2 = \alpha^2 + 2\alpha\beta + \beta^2 - 2\alpha\beta$

$= (\alpha + \beta) - 2\,\alpha\beta$

$= (5)^2 - 2\,(6)$

$= 25 - 12$

$\therefore$ $(\alpha^2 + \beta^2) = 13$

40. Here, as per given information,

AP : 3, 5, 7, ..., 37

$\therefore$ $a = 3,\ d = 5 - 3 = 2,\ a_n = l = 37$

$a_n = a + (n - 1)d$

$\therefore$ $37 = 3 + (n - 1)2$

$\therefore$ $37 - 3 = (n - 1)2$

$\therefore$ $\frac{34}{2} = n - 1$

$\therefore$ $n - 1 = 17$

$\therefore$ $n = 18$

Now, $S_n = \frac{n}{2}(a + a_n)$

$\therefore S_{18} = \frac{18}{2}(3 + 37)$

$\therefore S_{18} = 9 \times 40$

$\therefore S_{18} = 360$

Thus, there are 360 students in the school.

41. Here $a_{11} = 88$ & $a_{16} = 73$

$\therefore a + 10d = 88$ ...(1)

$\therefore a + 15d = 73$ ...(2)

Subtract (1) from (2),

$a + 15d - (a + 10d) = 73 - 88$

$a + 15d - a - 10d = -15$

$5d = -15$

$d = \frac{-15}{5}$

$d = -3$

Put, $d = -3$ in (1),

$a + 10(-3) = 88$

$a - 30 = 88$

$a = 88 + 30$

$a = 118$

Now, $a_{31} = a + 30d$

$= 118 + 30(-3)$

$= 118 - 90$

$\therefore a_{31} = 28$

31^{st} term will be 28.

Suppose n^{th} term of the AP be its first negative term.

$\therefore a_n < 0$

$\therefore a + (n - 1)d < 0$

$\therefore 118 + (n - 1)(-3) < 0$

$\therefore 118 < 3(n - 1)$

$\therefore \frac{118}{3} < n - 1$

$\therefore \frac{118}{3} + 1 < n$

$\therefore n > \frac{121}{3}$

$\therefore n > 40\frac{1}{3}$

Now, n being the number of a term is a positive integer and the smallest positive integer satisfying $n > 40\frac{1}{3}$ is 41.

Hence, the 41^{th} term of the given AP is its first negative term.

42. $AB = \sqrt{(1-4)^2 + (7-2)^2} = \sqrt{9+25} = \sqrt{34}$

$BC = \sqrt{(4+1)^2 + (2+1)^2} = \sqrt{25+9} = \sqrt{34}$

$CD = \sqrt{(-1+4)^2 + (-1-4)^2} = \sqrt{9+25} = \sqrt{34}$

$DA = \sqrt{(-4-1)^2 + (4-7)^2} = \sqrt{25+9} = \sqrt{34}$

$AC = \sqrt{(1+1)^2 + (7+1)^2} = \sqrt{4+64} = \sqrt{68}$

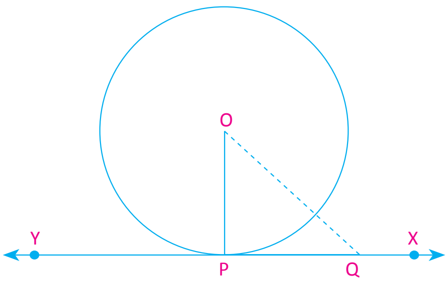
$BD = \sqrt{(4+4)^2 + (2-4)^2} = \sqrt{64+4} = \sqrt{68}$

Since, $AB = BC = CD = DA = \sqrt{34}$ and $AC = BD = \sqrt{68}$, all the four sides of the quadrilateral ABCD are equal and its diagonals AC and BD are also equal. So A(1, 7), B(4, 2), C(–1, –1) and D(–4, 4) are their vertices of a square.

43. Given : A circle with centre O and a tangent XY to the circle at a point P.

Prove that : OP is perpendicular to XY. i.e. OP ⊥ XY

Figure :



Proof : Take a point Q on XY other than P and join OQ.

The point Q must lie out side the circle. If Q lies inside the circle, XY will become a secant and not a tangent to the circle.

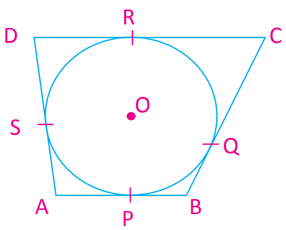
Therefore, Q is longer than the radius OP of the circle.

i.e., OQ > OP

Since, this happens for every point on line XY except the point P, OP is the shortest of all the distance of the point O to the point of XY.

So, OP is perpendicular to XY.

44.



Let the sides AB, BC, CD and DA of the quadrilateral ABCD touch the O centric circle at points P, Q, R and S respectively.

∴ AP = AS ...(1)

BP = BQ ...(2)

CR = CQ ...(3)

DR = DS ...(4)

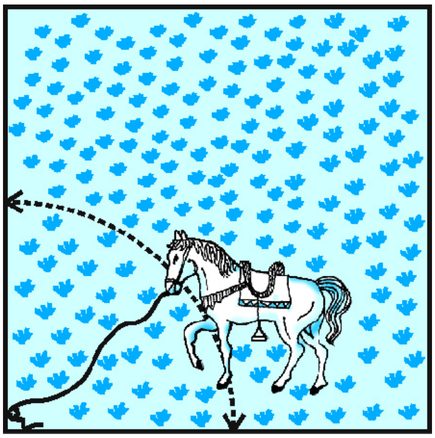
Add equation (1), (2), (3) and (4)

AP + BP + CR + DR = AS + BQ + CQ + DS

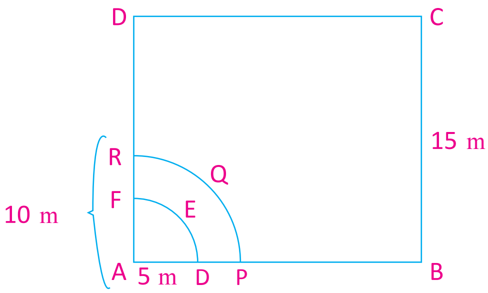
∴ (AP + BP) + (CR + DR) = (AS + DS) + (BQ + CQ)

∴ AB + CD = AD + BC

45.



(i) the area of that part of the field in which the horse can graze.



Here the 15 m sided square shaped farm ABCD. At the corner of which the horse is tied with a nail with a 5 m long rope. The horse can graze in as little as ADEF

In minor sector ADEF, $\theta = \angle A = 90°$ and $r = AD = 5$ m

The area that can be grazed by horse

= Area of sector ADEF

$= \dfrac{\pi r^2 \theta}{360}$

$= \dfrac{3.14 \times 5 \times 5 \times 90}{360}$

$= 19.625 \text{ m}^2$

(ii) the increase in the grazing area if the rope were 10 m long instead of 5 m. (Use $\pi = 3.14$)

If the rope is kept 10 m long, the horse can now do the shortest part in APQR.

In minor sector APQR.

$\theta = \angle A = 90°$ & $r = AP = 10$ m

Area of that can be grazed by horse

= Area of minor sector APQR

$= \dfrac{\pi r^2 \theta}{360}$

$= \dfrac{3.14 \times 10 \times 10 \times 90}{360}$

$= 78.5 \text{ m}^2$

$\therefore$ Increase in grazing area $= 78.5 - 19.625$

$= 58.875 \text{ m}^2$

46. Total number of roses = 5 red + 2 yellow + 3 white

= 10

(i) Suppose A be the event "the selected roses in red colour"

Number of red roses = 5

$\therefore$ The number of outcomes favourable to A = 5

$\therefore P(A) = \dfrac{5}{10} = \dfrac{1}{2}$

(ii) Suppose B be the event "the selected roses in yellow colour"

Number of yellow roses = 2

$\therefore$ The number of outcomes favourable to B = 5

$\therefore P(B) = \dfrac{2}{10} = \dfrac{1}{5}$

(iii) Suppose C be the event "the selected roses in non-white colour"

Number of white roses = 3

$\therefore$ Number of non-white roses = 10 – 3 = 7

The number of outcomes favourable to C = 7

$\therefore$ P (C) = $\frac{7}{10}$

Section-D

47. Suppose, the present age of Aftab is x & the present age of his daughter is y.

Before 7 years,

Age of Aftab = $x - 7$ &

Age of his daughter = $y - 7$

After 3 years,

Age of Aftab will become = $x + 3$

Age of daughter will become = $y + 3$

According to first condition;

$x - 7 = 7(y - 7)$

$\therefore x - 7 = 7y - 49$

$\therefore x - 7y = -42$ ...(1)

According to second condition;

$x + 3 = 3(y + 3)$

$\therefore x + 3 = 3y + 9$

$\therefore x - 3y = 6$ ...(2)

As per equation (1)

$x = 7y - 42$

Put value of x in equation (2)

$x - 3y = 6$

$\therefore 7y - 42 - 3y = 6$

$\therefore 7y - 3y = 6 + 42$

$\therefore 4y = 48$

$\therefore y = 12$

Put $y = 12$ in $x = 7y - 42$,

$\therefore x = 7(12) - 42$

$\therefore x = 84 - 42$

$\therefore x = 42$

Hence, Aftab and his daughter are 42 and 12 years old respectively.

48. Suppose the present age of Ashishkumar is x years and the sum of the present age of his two son Khush and Nilay is y years.

According to first condition,

$x = 2y$

$\therefore x - 2y = 0$ ....(1)

After 20 years,

$\therefore$ Age of Ashishkumar will become = $x + 20$

and sum of Age of his two son will become $= y + 20 + 20$

$= y + 40$

According to second condition,

$x + 20 = y + 40$

$x - y = 40 - 20$

$x - y = 20$ ....(2)

Subtract equ. (1) & (2)

$$\begin{array}{rl} x - 2y &= 0 \\ x - y &= 20 \\ - \quad + & \quad - \\ \hline -y &= -20 \end{array}$$

$\therefore y = 20$ years

From (1)

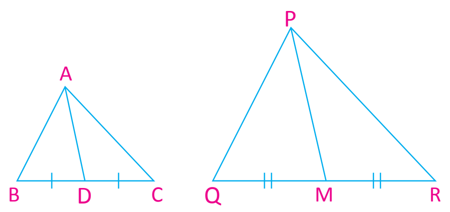
$x - 2(20) = 0$

$\therefore x - 40 = 0$

$\therefore x = 40$ years

Hence, Present age of Ashishkumar is 40 years.

49.



AD and PM are the medians of Δ ABC and Δ PQR respectively.

$\therefore$ BC = 2 BD and QR = 2 QM

Now, Δ ABC ~ Δ PQR

$$\therefore \frac{AB}{PQ} = \frac{BC}{QR}$$

$$\therefore \frac{AB}{PQ} = \frac{2\,BD}{2\,QM}$$

$$\therefore \frac{AB}{PQ} = \frac{BD}{QM}$$

Also, $\angle ABC = \angle PQR$

$\therefore \angle ABD = \angle PQM$

Now, Δ ABD and Δ PQM,

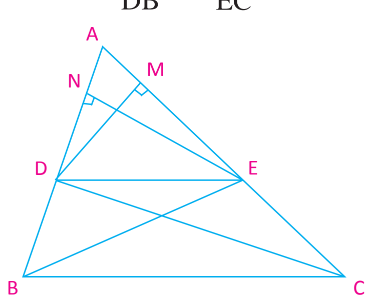
$$\frac{AB}{PQ} = \frac{BD}{QM} \text{ and } \angle ABD = \angle PQM$$

$\therefore$ Δ ABD ~ Δ PQM (SAS criterion)

$$\therefore \frac{AB}{PQ} = \frac{AD}{PM}$$

50. Given: In ABC, a line parallel to side BC intersects AB and AC at D and E respectively.

To prove: $\dfrac{AD}{DB} = \dfrac{AE}{EC}$



Proof : Join BE and CD and also draw DM $\perp$ AC and EN $\perp$ AB.

$$\text{Then, ADE} = \frac{1}{2} \times AD \times EN,$$

$$BDE = \frac{1}{2} \times DB \times EN,$$

$$ADE = \frac{1}{2} \times AE \times DM \text{ and}$$

$$DEC = \frac{1}{2} \times EC \times DM.$$

$$\therefore \frac{ADE}{BDE} = \frac{\frac{1}{2} \times AD \times EN}{\frac{1}{2} \times DB \times EN} = \frac{AD}{DB} \qquad ...(1)$$

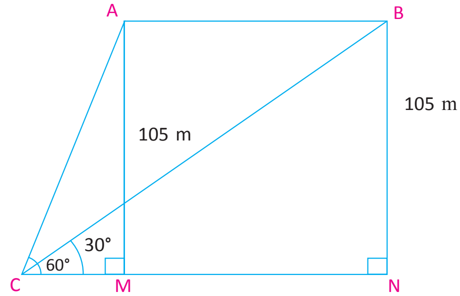
$$\text{and } \frac{ADE}{DEC} = \frac{\frac{1}{2} \times AE \times DM}{\frac{1}{2} \times EC \times DM} = \frac{AE}{EC} \qquad ...(2)$$

Now, Δ BDE and Δ DEC are triangles on the same base DE and between the parallel BC and DE.

then, BDE = DEC ...(3)

Hence from eq^n. (1), (2) and (3), $\frac{AD}{DB} = \frac{AE}{EC}$

51.



Here, A and B are the two locations of the balloon

CN is a horizontal line passing through the eye of the observer.

Draw AM ⊥ CN and BN ⊥ CN. So, M is the point on CN.

In Δ AMC, ∠M = 90° and ∠BCN = 30° and

In Δ BNC, ∠N = 90° and ∠ACM = 60°.

mAM = BN = 105 m

In Δ BNC, ∠N = 90°

$$\therefore \tan 30° = \frac{BN}{CN}$$

$$\therefore \frac{1}{\sqrt{3}} = \frac{105}{CN}$$

$$\therefore CN = 105\sqrt{3} \text{ m}$$

In Δ AMC, ∠M = 90°

$$\therefore \tan 60° = \frac{AM}{CM}$$

$$\therefore \sqrt{3} = \frac{105}{CM}$$

$$\therefore CM = \frac{105}{\sqrt{3}}$$

$$\therefore CM = 35\sqrt{3} \text{ m}$$

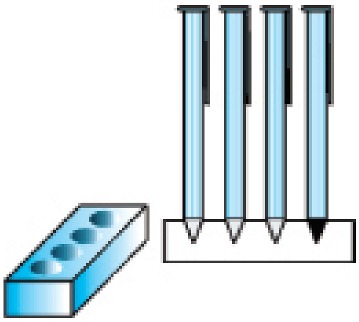
Now, MN = AB = CN – CM

$$\therefore AB = 105\sqrt{3} - 35\sqrt{3}$$

$$\therefore AB = 70\sqrt{3} \text{ m}$$

Thus, the distance covered by the balloon during a given time is $70\sqrt{3}$ m.

52.



A pen stand of wood of a cuboid

15 cm × 10 cm × 3.5 cm

Conical depressions

$r = 0.5$ cm

$h = 1.4$ cm

Volume of wood in stand = Volume of cuboid – (4 × Volume of cones)

$= 15 \text{ cm} \times 10 \text{ cm} \times 3.5 \text{ cm} - 4 \times \frac{1}{3}\pi r^2 h$

$= 525 - \left(4 \times \frac{1}{3} \times \frac{22}{7} \times 0.5 \times 0.5 \times 1.4\right)$

$= 525 - 1.47$

$= 523.53 \text{ cm}^3$

Hence, the volume of wood in the entired stand is 523.53 cm^3.

53. Cylinder :

$h = 2.1$ m

$d = 4$ m

$\therefore r = \frac{d}{2} = \frac{4}{2} = 2$ m

Cone :

$r = 2$ m

$l = 2.8$ m

Now, Area of canvas = CSA of Cylinder + CSA of Cone

$= 2\pi rh + \pi rl$

$= \pi r(2h + l)$

$= \frac{22}{7} \times 2 \times [2(2.1) + 2.8]$

$= \frac{44}{7} \times 7$

$= 44 \text{ m}^2$

Now,

Cost of canvas = Area of canvas × Rate of canvas

$= 44 \text{ m}^2 \times$ ₹ 350 per m^2

= ₹ 15,400

Therefore, it will cost ₹ 15,400 for making such a tent.

54.

Monthly unit (usage)	No. of customer (f)	(cf)
65 – 85	4	4
85 – 105	5	9
105 – 125	x	$9 + x$
125 – 145	20	$29 + x$
145 – 165	y	$29 + x + y$
165 – 185	8	$37 + x + y$
185 – 205	4	$41 + x + y$
	$n = 41 + x + y$	

Here, median = 137

$\Sigma f_i = n = 68 = 41 + x + y$

Median - class = 125 – 145

l = lower limit of median class = 125

cf = cumulative frequency of class preceding the median class = $9 + x$

f = frequency of median class = 20

$\frac{n}{2} = \frac{68}{2} = 34$

h = class size = 20

$$\text{Median M} = l + \left(\frac{\frac{n}{2} - cf}{f}\right) \times h$$

$$\therefore\ 137 = 125 + \left(\frac{34 - (9 + x)}{20}\right) \times 20$$

$\therefore\ 137 - 125 = 34 - 9 - x$

$\therefore\ 12 = 25 - x$

$\therefore\ x = 25 - 12$

$\therefore\ x = 13$

Now, $n = \Sigma x_i = 41 + x + y$

$\therefore\ 68 = 41 + 13 + y$

$\therefore\ 68 = 54 + y$

$\therefore\ y = 68 - 54$

$\therefore\ y = 14$

Thus, the number of customers with 105 to 125 and 145 to 165 unit usage is 13 and 14 respectively.