# MARKING SCHEME

## MATHEMATICS (BASIC) 430/2/1

### SECTION A

**1.** How many terms are there in the A.P. given below ?

14, 19, 24, 29, ....., 119

(a) 18 (b) 14

(c) 22 (d) 21

Answer (c) 22 1

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**2.** In what ratio does x-axis divide the line segment joining the points A(2, – 3) and B(5, 6) ?

(a) 2 : 3 (b) 2 : 1

(c) 3 : 4 (d) 1 : 2

Answer (d) 1 : 2 1

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**3.** $9 \sec^2 A - 9 \tan^2 A$ is equal to :

(a) 9 (b) 0

(c) 8 (d) $\frac{1}{9}$

Answer (a) 9 1

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**4.** The string of a kite in air is 50 m long and it makes an angle of 60° with the horizontal. Assuming the string to be straight, the height of the kite from the ground is :

(a) $50\sqrt{3}$ m (b) $\frac{100}{\sqrt{3}}$ m

(c) $\frac{50}{\sqrt{3}}$ m (d) $25\sqrt{3}$ m

Answer (d) $25\sqrt{3}$ m 1

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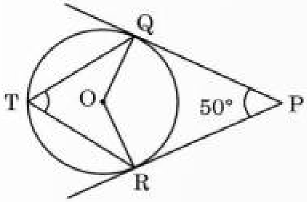
**5.** From a point P, two tangents PQ and PR are drawn to a circle with centre at O. T is a point on the major arc QR of the circle. If $\angle QPR = 50^\circ$, then $\angle QTR$ equals :




(a) 50° (b) 130°

(c) 65° (d) 90°

Answer (c) 65° 1

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**6.** The area of a sector of angle α (in degrees) of a circle with radius R is :

(a) $\frac{\alpha}{180} \times 2\pi R$ (b) $\frac{\alpha}{360} \times 2\pi R$

(c) $\frac{\alpha}{180} \times \pi R^2$ (d) $\frac{\alpha}{360} \times \pi R^2$

Answer (d) $\frac{\alpha}{360} \times \pi R^2$ 1

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**7.** If the HCF of 360 and 64 is 8, then their LCM is :

(a) 2480 (b) 2780

(c) 512 (d) 2880

Answer (d) 2880 1

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**8.** The curved surface area of a right circular cylinder of height 14 cm is 88 $cm^2$. The diameter of its circular base is :

(a) 2 cm (b) 1 cm

(c) 4 cm (d) 7 cm

Answer (a) 2 cm 1

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**9.** A die is rolled once. The probability that a composite number comes up, is :

(a) $\frac{1}{2}$  (b) $\frac{2}{3}$

(c) $\frac{1}{3}$  (d) 0

Answer (c) $\frac{1}{3}$ 1

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**10.** If the quadratic equation $9x^2 + bx + \frac{1}{4} = 0$ has equal roots, then the value of b is :

(a) 0  (b) $-3$ only

(c) 3 only  (d) $\pm 3$

Answer (d) $\pm 3$ 1

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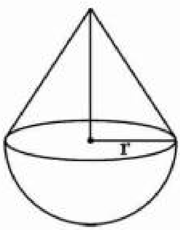
**11.** A solid is of the form of a cone of radius 'r' surmounted on a hemisphere of the same radius. If the height of the cone is the same as the diameter of its base, then the volume of the solid is :




(a) $\pi r^3$  (b) $\frac{4}{3}\pi r^3$

(c) $3\pi r^3$  (d) $\frac{2}{3}\pi r^3$

Answer (b) $\frac{4}{3}\pi r3$
1

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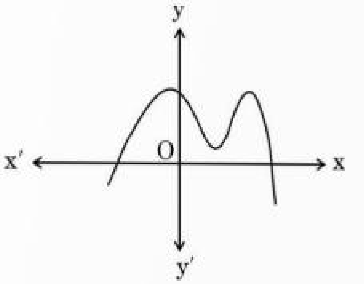
12. Graph of a polynomial p(x) is given in the figure. The number of zeroes of p(x) is :




(a) 2 (b) 3

(c) 4 (d) 5

Answer (a) 2 1

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13. The pair of linear equations $x + 2y - 5 = 0$ and $2x - 4y + 6 = 0$ :

(a) is inconsistent

(b) is consistent with many solutions

(c) is consistent with a unique solution

(d) is consistent with two solutions

Answer (c) is consistent with a unique solution 1

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14. Which of the following numbers ***cannot*** be the probability of an event ?

(a) 0·5 (b) 5%

(c) $\frac{1}{0{\cdot}5}$ (d) $\frac{0{\cdot}5}{14}$

Answer (c) $\frac{1}{0{\cdot}5}$ 1

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**15.** The value of $2\sin^2 30° + 3\tan^2 60° - \cos^2 45°$ is :

(a) $3\sqrt{3}$ (b) $\frac{19}{2}$

(c) $\frac{9}{4}$ (d) 9

Answer (d) 9 1

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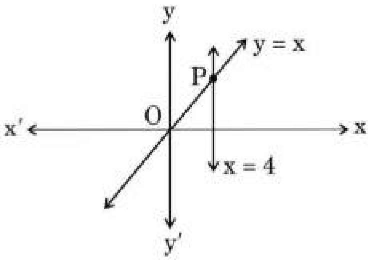
**16.** The lines represented by the linear equations $y = x$ and $x = 4$ intersect at P. The coordinates of the point P are :




(a) (4, 0) (b) (4, 4)

(c) (0, 4) (d) (– 4, 4)

Answer (b) (4, 4) 1

---

**17.** Median and Mode of a distribution are 25 and 21 respectively. Mean of the data using empirical relationship is :

(a) 27 (b) 29

(c) 18 (d) $\frac{29}{3}$

Answer (a) 27 1

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**18.** If $\tan A = \frac{2}{5}$, then the value of $\frac{1-\cos^2 A}{1-\sin^2 A}$ is :

(a) $\frac{25}{4}$ (b) $\frac{4}{25}$

(c) $\frac{4}{5}$ (d) $\frac{5}{4}$

Answer (b) $\frac{4}{25}$ 1

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*Questions number **19** and **20** are Assertion and Reason based questions carrying 1 mark each. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.*

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is ***not*** the correct explanation of the Assertion (A).

(c) Assertion (A) is true, but Reason (R) is false.

(d) Assertion (A) is false, but Reason (R) is true.

**19.** *Assertion (A) :* Polynomial $x^2 + 4x$ has two real zeroes.

*Reason (R) :* Zeroes of the polynomial $x^2 + ax \ (a \neq 0)$ are 0 and a.

Answer (c) Assertion (A) is true, **but** Reason (R) is false. 1

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**20.** *Assertion (A) :* The probability of getting a prime number, when a die is thrown once, is $\frac{2}{3}$.

*Reason (R):* On the faces of a die, prime numbers are 2, 3, 5.

Answer (d) Assertion (A) is false, **but** Reason (R) is true 1

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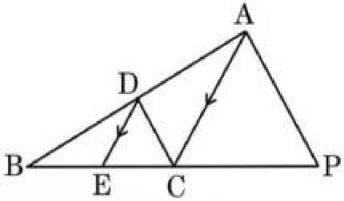
SECTION B

**21.** In the given figure, DE ∥ AC and $\frac{BE}{EC} = \frac{BC}{CP}$. Prove that DC ∥ AP.




Solution In $\Delta$ ABC, DE ∥ AC $\Rightarrow \frac{BE}{EC} = \frac{BD}{DA}$ 1

Also given, $\frac{BE}{EC} = \frac{BC}{CP} \Rightarrow \frac{BD}{DA} = \frac{BC}{CP}$ 1/2

$\therefore$ DC ∥ AP [Converse of BPT] 1/2

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**22.** (a) Find the HCF of the numbers 540 and 630, using prime factorization method.

**Solution** (a) $540 = 2^2 \times 3^3 \times 5$ 1/2

$630 = 2 \times 3^2 \times 5 \times 7$ 1/2

$HCF = 2 \times 3^2 \times 5 = 90$ 1

**OR**

(b) Show that $(15)^n$ cannot end with the digit 0 for any natural number 'n'.

**Solution** (b) $15^n = (3 \times 5)^n = 3^n \times 5^n$ 1

For a number to end with zero it should have both 2 and 5 in its prime factorization but $15^n$ has only prime numbers 3 and 5 as its factors so it can not end with zero. 1

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**23.** (a) Find the value(s) of 'x' so that PQ = QR, where the coordinates of P, Q and R are (6, −1), (1, 3) and (x, 8) respectively.

**Solution** (a) $PQ = QR \Rightarrow \sqrt{(6-1)^2+(-1-3)^2} = \sqrt{(x-1)^2+(8-3)^2}$ 1

$\Rightarrow (x-1)^2 = 16, \quad x-1 = \pm 4$ 1/2

$\Rightarrow x = -3 \text{ or } 5$ 1/2

**OR**

(b) The vertices of a triangle are (−2, 0), (2, 3) and (1, −3). Is the triangle equilateral, isosceles or scalene ?

**Solution** (b) Let vertices of $\Delta$ be A(− 2, 0), B(2, 3) and C(1, − 3)

$AB = \sqrt{4^2+3^2} = 5$ 1/2

$BC = \sqrt{(-1)^2+(-6)^2} = \sqrt{37}$ 1/2

$CA = \sqrt{(1+2)^2+(-3)^2} = 3\sqrt{2}$ 1/2

$\therefore \Delta ABC$ is a scalene triangle 1/2

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**24.** Find the value of 'k' such that the polynomial $p(x) = 3x^2 + 2kx + x - k - 5$ has the sum of zeroes equal to half of their product.

Solution $3x^2 + (2k+1)x - k - 5 = 0$

Sum of zeroes $= \frac{-(2k+1)}{3}$ 1/2

Product of zeroes $= \frac{-k-5}{3}$ 1/2

$\therefore \frac{-(2k+1)}{3} = -\frac{1}{2}\frac{(k+5)}{3}$ 1/2

$\Rightarrow 4k + 2 = k + 5 \Rightarrow k = 1$ 1/2

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**25.** From a well-shuffled deck of 52 playing cards, all diamond cards are removed. Now, a card is drawn from the remaining pack at random. Find the probability that the selected card is a king.

Solution Total number of cards = 52 – 13 = 39 1/2

Number of kings = 3 1/2

P(drawn card is a king) = $\frac{3}{39}$ **or** $\frac{1}{13}$ 1

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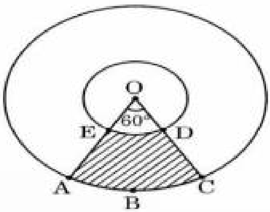
SECTION C

**26.** In the given figure, two concentric circles with centre O are shown. Radii of the circles are 2 cm and 5 cm respectively. Find the area of the shaded region.




Solution Area of sector OABC = $\frac{\pi \times 5^2 \times 60°}{360°} = \frac{25\pi}{6}$ cm$^2$ 1

Area of sector OED = $\frac{\pi \times 2^2 \times 60°}{360°} = \frac{4\pi}{6}$ cm$^2$ 1

Area of shaded region = $\frac{25\pi}{6} - \frac{4\pi}{6} = \frac{21}{6} \times \frac{22}{7} = 11$ cm$^2$ 1

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**27.** Prove that $4 + 2\sqrt{3}$ is an irrational number, given that $\sqrt{3}$ is an irrational number.

Solution Let us assume that $4 + 2\sqrt{3}$ is a rational number

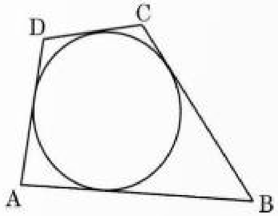
$4 + 2\sqrt{3} = \frac{p}{q}$; $q \neq 0$ and p, q are integers 1

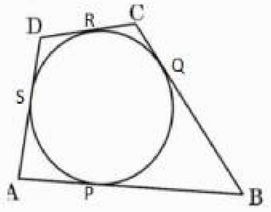
$\Rightarrow \sqrt{3} = \frac{p-4q}{2q}$ 1

RHS is rational but LHS is irrational

∴ Our assumption is wrong. Hence $4 + 2\sqrt{3}$ is an irrational number } 1

28. (a) A quadrilateral ABCD is drawn to circumscribe a circle, as shown in the figure. Prove that AB + CD = AD + BC.




Solution (a)

Tangents from an external point are equal therefore

AP = AS, BP = BQ, QC = CR and DR = DS 1

AB + CD = (AP + PB) + (CR + RD) 1/2

= (AS + BQ) + (CQ + DS) 1/2

= (AS + DS) + (BQ + CQ) 1/2

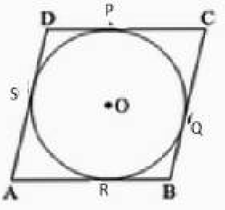
= AD + BC

1/2

**OR**

(b) **Prove that the parallelogram circumscribing a circle is a rhombus.**

Solution (b)




For figure *1*

Here AS = AR, DS = DP, CP = CQ And BQ = BR 1/2

Now AB + CD = (AR + RB) + (CP + DP) = (AS + BQ) + (CQ + DS)

= (AS + DS) + (BQ + CQ)

= AD + BC 1

Since ABCD is a parallelogram

Therefore, 2AB = 2AD or AB = AD 1/2

⇒ ABCD is a rhombus.

**29.** (a) Prove that :

$$\frac{1-\cos\theta}{1+\cos\theta} = (\text{cosec}\,\theta - \cot\theta)^2$$

Solution (a) LHS $= \frac{1-\cos\theta}{1+\cos\theta}$

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

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

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

$= (\text{cosec}\,\theta - \cot\theta)^2$ = RHS 1/2

OR

(b) Prove that :

$$\left(1+\frac{1}{\tan^2 A}\right)\left(1+\frac{1}{\cot^2 A}\right) = \frac{1}{\sin^2 A - \sin^4 A}$$

Solution (b)LHS $= \left(1+\frac{\cos^2 A}{\sin^2 A}\right)\left(1+\frac{\sin^2 A}{\cos^2 A}\right)$ 1

$= \left(\frac{\sin^2 A+\cos^2 A}{\sin^2 A}\right)\left(\frac{\cos^2 A+\sin^2 A}{\cos^2 A}\right)$

$= \frac{1}{\sin^2 A} \times \frac{1}{\cos^2 A}$ 1

$= \frac{1}{\sin^2 A\,(1-\sin^2 A)}$ $\frac{1}{2}$

$= \frac{1}{\sin^2 A - \sin^4 A}$ = RHS $\frac{1}{2}$

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**30.** Find the zeroes of the polynomial $p(x) = 2x^2 - 7x - 15$ and verify the relationship between its coefficients and zeroes.

Solution $p(x) = 2x^2 - 7x - 15 = 0$

$\Rightarrow (2x + 3)(x - 5) = 0$ 1

$\Rightarrow \alpha = x = -\frac{3}{2},\ \beta = x = 5.$ 1

$\therefore \alpha + \beta = -\frac{3}{2} + 5 = \frac{7}{2} = -\frac{(-7)}{2} = \frac{-\,coefficient\ of\ x}{coefficient\ of\ x^2}$ 1/2

$\alpha\beta = -\frac{3}{2} \times 5 = -\frac{15}{2} = \frac{constant\ term}{coefficient\ of\ x^2}$ 1/2

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**31.** Prove that the points A(–1, 0), B(3, 1), C(2, 2) and D(–2, 1) are the vertices of a parallelogram ABCD. Is it also a rectangle ?

Solution Mid-point of AC = $(\frac{1}{2}, 1)$ 1/2

Mid-point of BD = $(\frac{1}{2}, 1)$ 1/2

Since Mid-point of AC = BD, therefore ABCD is a parallelogram. 1

Now AC = $\sqrt{9+4} = \sqrt{13}$

and BD = $\sqrt{25+0} = \sqrt{25} = 5$

$\therefore$ AC $\neq$ BD therefore ABCD is not a rectangle. 1

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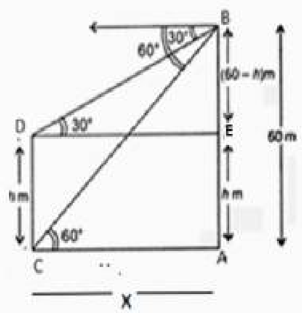
## SECTION D

**32.** (a) From the top of a building 60 m high, the angles of depression of the top and bottom of a tower are observed to be 30° and 60° respectively. Find the height of the tower. Also, find the distance between the building and the tower. (Use $\sqrt{3}$ = 1·732)

Solution (a)




For figure 1

Let AB be the building and CD be the tower

In $\Delta BAC$, $\tan 60° = \frac{60}{x} \Rightarrow x = \frac{60}{\sqrt{3}} = 20\sqrt{3}$ _______ (i) *1+1/2*

In $\Delta BED$, $\tan 30° = \frac{60-h}{x} \Rightarrow 60 - h = \frac{20\sqrt{3}}{\sqrt{3}}$ _______ (ii) *1+1/2*

using equations (i) and (ii)

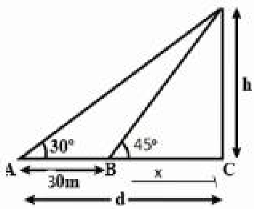
distance between building and the tower = x = $20\sqrt{3}$ = 34·64 m 1/2

and the height of tower = h = 40 m 1/2

**OR**

(b) **The angle of elevation of the top of a building from a point A on the ground is 30°. On moving a distance of 30 m towards its base to the point B, the angle of elevation changes to 45°. Find the height of the building and the distance of its base from point A. (Use $\sqrt{3}$ = 1·732)**

Solution (b)




For figure 1

Let CD be the building

In $\Delta DCA$, $\tan 30° = \frac{h}{x+30} \Rightarrow \frac{1}{\sqrt{3}} = \frac{h}{x+30}$ _______ (i) *1+1/2*

In $\Delta DCB$, $\tan 45° = \frac{h}{x} \Rightarrow h = x$ _______ (ii) *1*

using equations (i) and (ii), $h = x = 15(\sqrt{3}+1)$ 1/2

$= 15 \times 2{\cdot}732 = 40.98$ m

Height of building h = x = 40·98 m 1/2

Distance(d) of base from point A = x + 30 = 70.98 m 1/2

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**33.** Find the mean and the median of the following data :

| Marks | Number of Students |
|---|---|
| 0 – 10 | 3 |
| 10 – 20 | 5 |
| 20 – 30 | 16 |
| 30 – 40 | 12 |
| 40 – 50 | 13 |
| 50 – 60 | 20 |
| 60 – 70 | 6 |
| 70 – 80 | 5 |

Solution — Correct table 2

| Marks | x | f | $u = \frac{x-35}{10}$ | fu | cf |
|---|---|---|---|---|---|
| 0 – 10 | 5 | 3 | – 3 | – 9 | 3 |
| 10 – 20 | 15 | 5 | – 2 | – 10 | 8 |
| 20 – 30 | 25 | 16 | – 1 | – 16 | 24 |
| 30 – 40 | 35 | 12 | 0 | 0 | 36 |
| 40 – 50 | 45 | 13 | 1 | 13 | 49 |
| 50 – 60 | 55 | 20 | 2 | 40 | 69 |
| 60 – 70 | 65 | 6 | 3 | 18 | 75 |
| 70 – 80 | 75 | 5 | 4 | 20 | 80 |
| | | 80 | | 56 | |

Mean $= 35 + (10 \times \frac{56}{80}) = 42$ — 1+1/2

Median class : 40-50 — 1/2

Median $= 40 + \frac{10}{13}(40 - 36) = 43{\cdot}1$ (approx..) — 1

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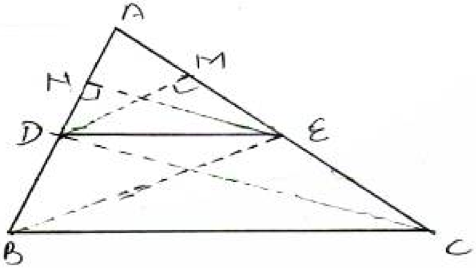
**34.** If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in the same ratio.

Solution (a) For figure 1




Given In $\Delta$ ABC, DE // BC 1/2

To prove : $\frac{AD}{DB} = \frac{AE}{EC}$ 1/2

Const. : Join BE, CD. Draw DM $\perp$ AC and EN $\perp$ AB 1/2

Proof : $\frac{ar(\Delta\, ADE)}{ar(\Delta\, BDE)} = \frac{\frac{1}{2} \times AD \times EN}{\frac{1}{2} \times DB \times EN} = \frac{AD}{DB}$ ______ (i) 1

**S**imilarly $\frac{ar(\Delta\, ADE)}{ar(\Delta\, CDE)} = \frac{AE}{EC}$ ______ (ii) 1/2

$\Delta$ BDE and $\Delta$ CDE are on the same base DE and between the same parallel lines BC and DE.

ar($\Delta$ BDE) = ar($\Delta$ CDE) ______ (iii) 1/2

From (i), (ii) and (iii)

$\frac{AD}{DB} = \frac{AE}{EC}$ 1/2

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**35.** (a) If the sum of the first 7 terms of an A.P. is −14 and that of 11 terms is – 55, then find the sum of its first 'n' terms.

Solution (a) $\frac{7}{2}(2a + 6d) = -14$ ______ (i) *1*

$\frac{11}{2}(2a + 10d) = -55$ ______ (ii) *1*

Solving (i) and (ii) $d = -\frac{3}{2}$, $a = \frac{5}{2}$ *1+1*

$S_n = \frac{n}{2}\,[5 + (n-1)(-\frac{3}{2})] = \frac{n}{4}\,[13 - 3n]$ *1*

**OR**

(b) In an A.P., the sum of the first 'n' terms is $3n^2 + n$. Find the first term and the common difference of the A.P. Hence, find its $15^{th}$ term.

**Solution** (b) Here $S_n = 3n^2 + n$

So, $a_1 = S_1 = 3(1)^2 + 1 = 4$ 1

$S_2 = a_1 + a_2 = 3(2)^2 + 2 = 14$ 1

$\Rightarrow a_2 = 10$ 1

Now $a_2 = a_1 + d = 10 \Rightarrow d = 6$ 1

$\Rightarrow a_{15} = a + 14d$

$= 4 + 14(6) = 88$ 1

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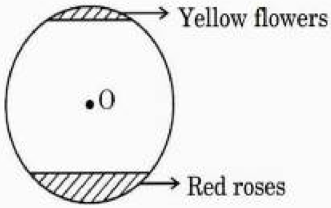
## SECTION E

**36.** Flower beds look beautiful growing in gardens. One such circular park of radius 'r' m, has two segments with flowers. One segment which subtends an angle of 90° at the centre is full of red roses, while the other segment with central angle 60° is full of yellow coloured flowers. [See figure]




It is given that the combined area of the two segments (of flowers) is $256\frac{2}{3}$ sq m.

Based on the above, answer the following questions :

(i) Write an equation representing the total area of the two segments in terms of 'r'. *1*

(ii) Find the value of 'r'. *1*

(iii) (a) Find the area of the segment with red roses. *2*

**OR**

(iii) (b) Find the area of the segment with yellow flowers. *2*

**Solution** (i) Total area of two segments = $\frac{1}{4}\pi r^2 - \frac{1}{2} r^2 + \frac{1}{6}\pi r^2 - \frac{\sqrt{3}}{4} r^2 = 256\frac{2}{3}$ 1

(ii) $(\frac{1}{4}\pi - \frac{1}{2} + \frac{1}{6}\pi - \frac{\sqrt{3}}{4})r^2 = \frac{770}{3}$
1

$\Rightarrow r = 26.1$ cm (approx.)

(iii)(a) Area of segment with red roses = $\frac{1}{4}\pi r^2 - \frac{1}{2} r^2$ sq m 2

= 194.63 sq m (approx.)

**OR**

(iii)(b) Area of segment with yellow roses = $\frac{1}{6}\pi r^2 - \frac{\sqrt{3}}{4} r^2$ sq m 2

= 62.03 sq m (approx.)

Note: If the student has correctly written the area of two segments in part (i), then 2 marks to be awarded for part (iii), even if the student has not attempted part (iii).

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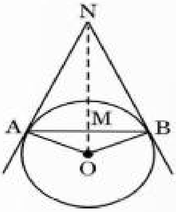
**37.** Circles play an important part in our life. When a circular object is hung on the wall with a cord at nail N, the cords NA and NB work like tangents. Observe the figure, given that $\angle ANO = 30^\circ$ and OA = 5 cm.




Based on the above, answer the following questions :

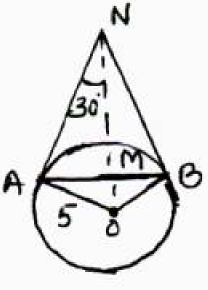
(i) Find the distance AN.

(ii) Find the measure of $\angle AOB$.

(iii) (a) Find the total length of cords NA, NB and the chord AB.

**OR**

(iii) (b) If $\angle ANO$ is 45°, then name the type of quadrilateral OANB. Justify your answer.




Solution (i) $\tan 30^\circ = \frac{5}{AN}$ 1/2

$\Rightarrow AN = 5\sqrt{3}$ cm 1/2

(ii) $\angle BNO = 30^\circ \Rightarrow \angle BNA = 60^\circ$

$\therefore \angle AOB = 180^\circ - 60^\circ = 120^\circ$ 1

(iii) (a) $AN = 5\sqrt{3}$ and in $\Delta$ ANB, $\angle ANB = 60^\circ$ and NA = NB

$\therefore \angle NAB = \angle NBA = 60^\circ$ or $\Delta$ NAB is an equilateral $\Delta$ 1/2

Hence, $AB = 5\sqrt{3}$ cm. 1

$AN + NB + AB = 3 \times 5\sqrt{3} = 15\sqrt{3}$ cm. 1/2

**OR**

(iii) (b) $\angle ANO = 45° \Rightarrow \angle AOB = 90°$ 1/2

$\therefore$ Each angle of quad. AOBN is 90°. 1

Also, OA = OB. $\therefore$ OANB is a square. 1/2

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**38.** A wooden toy is shown in the picture. This is a cuboidal wooden block of dimensions 14 cm × 17 cm × 4 cm. On its top there are seven cylindrical hollows for bees to fit in. Each cylindrical hollow is of height 3 cm and radius 2 cm.

Based on the above, answer the following questions :

(i) Find the volume of wood carved out to make one cylindrical hollow.

(ii) Find the lateral surface area of the cuboid to paint it with green colour.

(iii) (a) Find the volume of wood in the remaining cuboid after carving out seven cylindrical hollows.

**OR**

(iii) (b) Find the surface area of the top surface of the cuboid to be painted yellow.

Solution (i) Volume of wood carved out to make one hollow

$$= \frac{22}{7} \times 2 \times 2 \times 3 = \frac{264}{7} \text{ cm}^3 \text{ or } 37.7 \text{ cm}^3 \qquad 1$$

(ii) LSA of cuboid = $2(14 \times 4 + 17 \times 4) = 248 \text{ cm}^2$. 1

(iii)(a) Volume of 7 cylindrical hollows = $264 \text{ cm}^3$. 1/2

Volume of original cuboid = $14 \times 17 \times 4 = 952 \text{ cm}^3$. 1

$\therefore$ Volume of remaining solid = $952 - 264 = 688 \text{ cm}^3$. 1/2

**OR**

(iii) (b) Area of top surface to be painted = $(l \times b) - 7 \times \pi r^2$

$$= (14 \times 17) - (\frac{22}{7} \times 4 \times 7) \qquad 1$$

$$= 150 \text{ cm}^2 \qquad 1$$

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