TARGET MATHEMATICS
THE EXCELLENCE KEY
AGYAT GUPTA (M.Sc., M.Phil.)

CODE:- AG-TS-11-0036 REG.NO:-TMC -D/79/89/36

GENERAL INSTRUCTIONS :-

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into four sections A,B,C and D. Section – A comprises of 8 question of 1 mark each. Section – B comprises of 6 questions of 2 marks each. Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 10 questions of 4 marks each.
3. Question numbers 1 to 8 in Sections – A are multiple choice questions where you are to select one correct option out of the given four.
4. There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four mark each. You have to attempt only one lf the alternatives in all such questions.
5. Use of calculator is not permitted.
6. Please check that this question paper contains 6 printed pages.

सामान्य निर्देश :

1. सभी प्रश्न अनिवार्य हैं।
2. इस प्रश्न पत्र में 34 प्रश्न है, जो चार खण्डों में अ, ब, स व द में विभाजित है। खण्ड – अ में 8 प्रश्न हैं और प्रत्येक प्रश्न 1 अंक का है। खण्ड – ब में 6 प्रश्न हैं और प्रत्येक प्रश्न 2 अंको के हैं। खण्ड – स में 10 प्रश्न हैं और प्रत्येक प्रश्न 3 अंको का है। खण्ड – द में 10 प्रश्न हैं और प्रत्येक प्रश्न 4 अंको का है।
3. प्रश्न संख्या 1 से 8 बहुविकल्पीय प्रश्न हैं। दिए गए चार विकल्पों में से एक सही

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विकल्प चुनें।

4. इसमें कोई भी सर्वोपरि विकल्प नहीं है, लेकिन आंतरिक विकल्प 1 प्रश्न 2 अंको में, 3 प्रश्न 3 अंको में और 2 प्रश्न 4 अंको में दिए गए हैं। आप दिए गए विकल्पों में से एक विकल्प का चयन करें।
5. कैलकुलेटर का प्रयोग वर्जित है।
6. इस प्रश्न–पत्र को पढ़ने के लिऐ 15 मिनिट का समय दिया गया है। इस अवधि के दौरान छात्र केवल प्रश्न–पत्र को पढेंगे और वे उत्तर–पुस्तिका पर कोई उत्तर नहीं लिखेंगें।

Pre-Board Examination 2012 -13

MATHEMATICS CLASS X (SA-2)

Time : 3 to $3\frac{1}{4}$ Hours Maximum Marks : 90

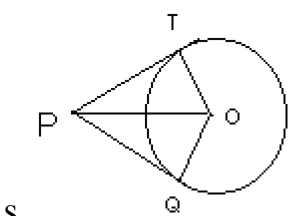
SECTION A

Q.1 If one roots of the equation $2x^2 - 3x + p = 0$ is 3, then value of p is
(a) -8 (b) 8 (c) -9 (d) 9 Ans c

Q.2 Minute hand of a clock is 21cm. Distance moved by the tip of minute hand in 1 hr is (a) $21\pi cm$ (b) $42\pi cm$ (c) $10.5\pi cm$ (d) $7\pi cm$ Ans b

Q.3 If AB = 4m and AC =8m, then angle of observation of A as observed from C is (a) 60^0 (b) 30^0 (c) 45^0 (d) can not be determined Ans b

Q.4 If PQ and PT are tangents to a circle with centre O and radius 5 cm. If PQ



= 12, then perimeter of quadrilateral PQOT is
(a) 24cm (b) 34cm (c) 17cm (d) 20cm Ans b

Q.5 1^{st} term of an AP is -3 and common difference is -2 , then fourth term of the AP is (a) 3 (b) -3 (c) 4 (d) -9 Ans d

Q.6	Distance of point (1,2), from the mid point of the line segment joining the points (6,8) and (2,4) is (a)4 units (b) 3 units (c) 2 units (d) 5 units Ans d
Q.7	A card is drawn from a pack of 52 playing cards. The probability of getting a face card is (a) 3/13 (b) 4/13 (c) 1/2 (d) 2/3 Ans a
Q.8	A circle is inscribed in a triangle with sides 8, 15 and 17cm. The radius of the circle is (a) 6cm (b) 5cm (c) 4cm (d) 3cm Ans d
	SECTION B
Q.9	Show that the points $A(a, a), B(-a,-a), C(-a\sqrt{3}, a\sqrt{3})$ form an equilateral triangle. Ans. $AB=\sqrt{(-a-a)^2+(-a-a)^2}=\sqrt{4a^2+4a^2}=2\sqrt{2}\,a$ $BC=\sqrt{\left(-a\sqrt{3}+a\right)^2+\left(a\sqrt{3}+a^2\right)}$ $=\sqrt{3a^2+a^2-2\sqrt{3}a^2+3a^2+a^2+2\sqrt{3}a^2}=\sqrt{8a^2}=2\sqrt{2}\,a$ 1 $AC=\sqrt{\left(-a\sqrt{3}-a\right)^2+\left(a\sqrt{3}-a\right)^2}$ 1 $=\sqrt{3a^2+a^2+2\sqrt{3}a^2+3a^2+a^2-2\sqrt{3}a^2}=\sqrt{8a^2}=2\sqrt{2}\,a$ $AB=BC=AC\Rightarrow$ It is an equilateral triangles. 1
Q.10	Justify the statement: "Tossing a coin is a fair way of deciding which team should get the batting First at the beginning of a cricket game." **Sol.** When we toss a coin, the outcomes head and tail are equally likely. Thus,the result of an individual coin toss is completely unpredictable.Hence both the teams get equal chance to bat first so the given statement is justified. **OR** One card is drawn from a well shuffled deck of 52 playing cards. Find the probability of getting (i) a non-face card (ii) a black king or a red

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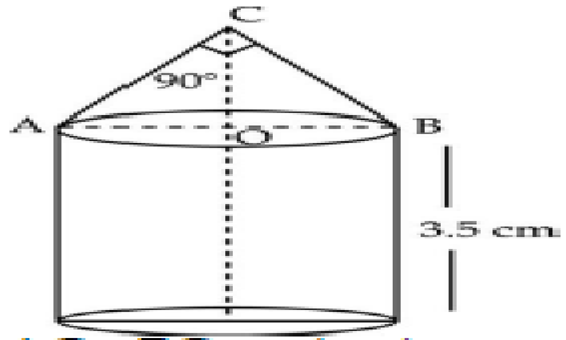
	queen.Ans 10/13 or 1/13
Q.11	Find the middle terms in the A.P. 20, 16, 12,…., (-176). ANS: $a=20\quad d=-4$ ½ $a_n=a+(n-1)d$ $-176=20-4n+4$ ½ $-200=-4n$ ½ $n=50$ ½ Middle terms are 25^{th} and 26^{th} a25) 1 25^{th} term $=(-7\ 6)$ and 26^{th} term $=(-80)$
Q.12	Cards each marked with one of the numbers 4,5,6…..20 are placed in a box and mixed thoroughly One card is drawn at random from the box. What is the probability of getting an even prime number ?Ans 0
Q.13	Write the nature of roots of the quadratic equation $\sqrt{5}x^2-3\sqrt{6}x-\sqrt{20}=0$. . Ans D = 94 ; Real , un equal , irrational
Q.14	Find the fourth vertex of the rectangle whose three vertices taken in order are (4, 1) , (7 ,4) , (13 , -2) .Ans (10 , - 5)
	SECTION C
Q.15	A toy is in the form of a cylinder of diameter $2\sqrt{2}$ m and height 3.5 m surmounted by cone whose vertical angle is $60°$. find total surface area of the top.



$AC = BC = x$ (say)

$\therefore AB^2 = AC^2 + BC^2 = 2x^2$

$\therefore 2x^2 = (2\sqrt{2})^2$

$\Rightarrow x = 2$

$\therefore$ Slant height of conical portion $= 2$ m

Total S.A of toy $= 2\pi rh + \pi r^2 + \pi rl$

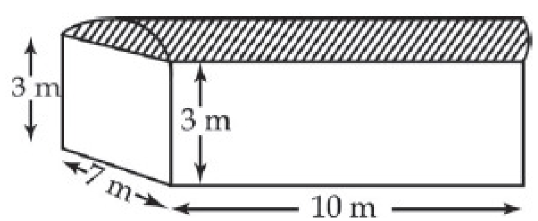
$= \pi r[7 + \sqrt{2} + 2]\text{m}^2$

$= \pi\sqrt{2}\,[9 + \sqrt{2}\,]\text{m}^2$

ANS: $= \pi[2 + 9\sqrt{2}\,]\text{m}^2$

OR

A godown is in the form as shown in the figure. The vertical cross-section parallel to the width side of the building is a rectangle of size 7m × 3m mounted by a semicircle of radius 3.5m. The inner measurements of the cubidal portion are 10m × 7m × 3m. Find the volume of the godown.



Ans.

Volume of godown = Volume of cuboid + $\frac{1}{2}$ volume of cylinder

$= L \times B \times H + \frac{1}{2} \times \frac{\pi r^2 h}{2}$ 1

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$= 10 \times 7 \times 3 + \frac{1}{2} \times \frac{1}{\cancel{2}_{1}} \times \frac{\cancel{22}^{11}}{\cancel{7}} \times \frac{\cancel{7}}{2} \times \frac{7}{\cancel{2}} \times \cancel{10}^{5}$ 1½

$= 210 + \frac{385}{4}$

$= 210 + 96.25$

$= 306.25\ \text{m}^3$ 1½

Q.16 Find the area of the quadrilateral whose vertices taken in order are A (- 5, - 3), B (- 4, - 6), C (2, - 1) and D (1, 2). Area of quad. ABCD $= \left(\frac{23}{2} + \frac{23}{2}\right) = 23\ \text{units}^2$

Q.17 In Figure 2, PA and PB are tangents to the circle drawn from an external point P. CD is a third tangent touching the circle at Q.If PB = 10 cm and CQ = 2 cm, what is the length of PC?

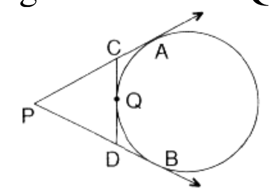
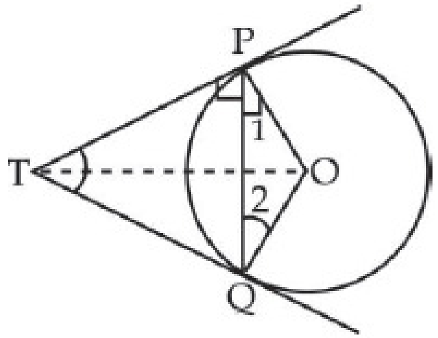


Fig. 2

Ans. 8 cm

Q.18 Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$. Ans.



We know that **1**

$\angle PTQ = 180° - \angle POQ$

$= \angle 1 + \angle 2$ **1**

$= 2\angle 1$ ($\because \angle 1 = \angle 2$ as OP = OQ) **1**

$= 2\angle OPQ$ **1**

Q.19 In a school, physical-education teacher wants to stand the student in the from of a square for their physical exercise. He found that 24 student are left, then he increases the size of the square by 1 student, he found that there are shortage of 25 students. Find the total number of students in the school. Why physical exercise is essential for the students. Which value will be reflected among students? Ans: Number of students 600, physical exercise makes the physical and mental fitness of the students. Students will be conscious and disciplined.

Q.20 The angle of elevation of the top of a tower at a point on the level ground is 30°. After walking a distance of 100 m towards the foot of the tower along the horizontal line through the foot of the tower on the same level ground, the angle of elevation of the top of the tower is 60°. Find the

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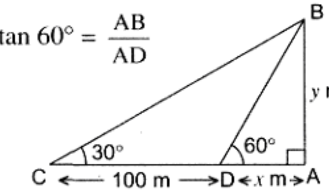
height of the tower. Sol. In rt. ΔBAD, $\tan 60° = \frac{AB}{AD}$

$\Rightarrow \frac{\sqrt{3}}{1} = \frac{y}{x}$

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

$\Rightarrow x = \frac{y}{\sqrt{3}}$ ...(*i*)



In it. ABAC, $\tan 30° = \frac{AB}{AC} \Rightarrow \frac{1}{\sqrt{3}} = \frac{y}{x+100} \Rightarrow \sqrt{3}y = x + 100 \Rightarrow \sqrt{3}y - x = 100 \Rightarrow \sqrt{3}y - \frac{y}{\sqrt{3}} = 100$...[From(0] $\Rightarrow \frac{3y-y}{\sqrt{3}} = \frac{100}{1} \Rightarrow 2y = 100\sqrt{3} \Rightarrow$ y = 50(1.732) Height of the tower = 86.6 m

Q.21 The altitude of a right triangle is 7cm. less than its base. If the hypotenuse is 13cm, find the other two sides. Ans base = 12cm altitude = 5cm

OR

Solve for x: $12abx^2 - (9a^2 - 8b^2)x - 6ab = 0$. Ans $\left\{\frac{3a}{4b}, \frac{-2b}{3a}\right\}$

Q.22 A square field and an equilateral triangular park have equal perimeters. If the cost of ploughing the field at the rate of Rs. 5/m^2 is Rs. 720, find the cost of maintaining the park at the rate of Rs. 10/m^2. **Sol.** Let the side of the square be x m Area of the square = $\frac{\text{Total Cost}}{\text{Rate per m}^2} \Rightarrow x^2 = \frac{720}{5}$ = 144 m^2 ⇒ x = $\sqrt{144}$ = + 12 m (∴ side can not be - ve) ⇒ Perimeter of square = $4x$ = 4 (12) = 48 m Let side of Δ be y m Perimeter of a Δ = Perimeter of a square ... (Given) $3y$ = 48 ∴ y = $\frac{48}{3}$ = 16 m . Area of an equilateral $\Delta = \frac{\sqrt{3}}{4}(\text{side})^2 = \frac{\sqrt{3}}{4}(y)^2$ = √3/4 × 16 × 16 = 64√3 m^2 ⇒ Cost of maintaining the park @ Rs.10 per m^2 = 64√3 × 10 = 640 ×1.732 ...[∵ √3 = 1.732] = **Rs.** 1108.48

OR

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An iron solid sphere of radius 3 cm is melted and recast into small spherical balls of radius 1 cm each. Assuming that there is no wastage in the process, find the number of small spherical balls made from the given sphere. Sol. Number of small spherical balls

$= \dfrac{\text{Vol. of given sphere}}{\text{Vol. of one small spherical ball}} = \dfrac{\frac{4}{3}\pi(3)^3}{\frac{4}{3}\pi(1)^3}$ [Δ Vol. of a sph. $= \frac{4}{3}\pi r^3$] = 27

Q.23 In Fig. 7, OAPB is a sector of a circle of radius 3.5 cm with the centre at O and $\angle AOB = 120°$. Find the length of OAPBO.

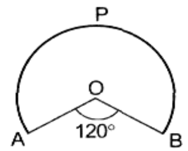

Fig. 7

Sol. $\theta = 360° - 120° = 240° \Rightarrow r = 3.5$ cm $= \frac{35}{10} = \frac{7}{2}$ cm.

Length of OAPBO = Length of arc BPA + OA + OB

$= \frac{\theta}{360}(2\pi r) + r + r = \left(\frac{240}{360} \times 2 \times \frac{22}{7} \times \frac{7}{2}\right) + 2r = \left(\frac{2}{3} \times 22\right) + \left(2 \times \frac{7}{2}\right) = \frac{44}{3} + 7 = \frac{44+21}{3} = \frac{65}{3} = \mathbf{21\frac{2}{3}}$

Q.24 The sum of third and seventh terms of an A.P. is 6 and their product is 8. Find the sum of first sixteen terms of the A.P.

Ans $a = 1, d = \frac{1}{2}, s_{16} = 76$ & $a = 5; d = -\frac{1}{2}; s_{16} = 20$

OR

Evaluate: $3+5+7+6+9+12+9+13+17+\ldots$ .to 30 terms. Ans 690

SECTION D

Q.25 In Fig. 12.15, two circular flower beds have been shown on two sides of a square lawn ABCD of side 56 m. If the centre of each circular flower bed is the point of intersection O of the diagonals of the square lawn, find the sum of the areas of the lawn and the flower beds.

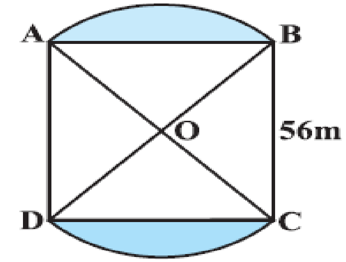

Fig. 12.15

Solution : Area of the square lawn ABCD = 56×56 m^2

Let $OA = OB = x$ metres

So, $x^2 + x^2 = 56^2$

or, $2x^2 = 56 \times 56$

or, $x^2 = 28 \times 56$

area of sector OAB $= \frac{90}{360} \times \pi x^2 = \frac{1}{4} \times \pi x^2$

$= \frac{1}{4} \times \frac{22}{7} \times 28 \times 56$ m^2

area of Δ OAB $= \frac{1}{4} \times 56 \times 56$ m^2 $(\angle AOB = 90°)$

area of flower bed AB $= \left(\frac{1}{4} \times \frac{22}{7} \times 28 \times 56 - \frac{1}{4} \times 56 \times 56\right)$ m^2

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	$= \frac{1}{4} \times 28 \times 56 \left(\frac{22}{7} - 2\right) m^2$ $= \frac{1}{4} \times 28 \times 56 \times \frac{8}{7} m^2$ Similarly, area of the other flower bed $= \frac{1}{4} \times 28 \times 56 \times \frac{8}{7} m^2$ total area $= \left(56 \times 56 + \frac{1}{4} \times 28 \times 56 \times \frac{8}{7} + \frac{1}{4} \times 28 \times 56 \times \frac{8}{7}\right) m^2$ [Fro $= 28 \times 56 \left(2 + \frac{2}{7} + \frac{2}{7}\right) m^2$ $= 28 \times 56 \times \frac{18}{7} m^2 = 4032 m^2$ **Alternative Solution :** Total area = Area of sector OAB + Area of sector ODC + Area of Δ OAD + Area of Δ OBC

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	$= \left(\frac{90}{360} \times \frac{22}{7} \times 28 \times 56 + \frac{90}{360} \times \frac{22}{7} \times 28 \times 56 + \frac{1}{4} \times 56 \times 56 + \frac{1}{4} \times 56 \times 56\right) m^2$ $= \frac{1}{4} \times 28 \times 56 \left(\frac{22}{7} + \frac{22}{7} + 2 + 2\right) m^2$ $= \frac{7 \times 56}{7} (22 + 22 + 14 + 14) m^2$ $= 56 \times 72 \, m^2 = 4032 \, m^2$
Q.26	Two friends Surender and Haneef are visiting fruit market in the same week (Monday to Saturday) to parchase fruits. Each is equally likely to visit the market on any one day as on another. What is the probability that both will visit the market on (i) same day (ii) different days. Would you like to eat fruits and why . Ans: (i) When both visit the market on the same day then it may be Monday or Tuesday or Wednesday or Thursday or Friday or Saturday is 6 $= \frac{1}{6}$. (ii) Probability of Surender and Haneet to visit the market on different day $= \frac{5}{6}$. Yes, I would like to suggest to eat fruits because fruits are useful for good health.
Q.27	Construct a triangle similar to a given ΔABC in which AB = 4 cm , BC = 6

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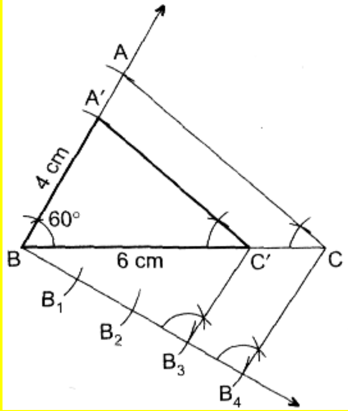
	cm and ∠ABC = 60°, such that each side of the new triangle is ¾ of the given ΔABC. **Sol.**  ΔA'BC is the required Δ.
Q.28	Find the value of *k* so that the following quadratic equation has equal roots : $2x^2 - (k - 2)x + 1 = 0$. **Sol.** Here $a = 2$. $b = -(k - 2) = -k + 2 = 2 - k$, $c = 1$ ⇒ D = 0 ∵ Equal roots...(Given) ⇒ $b^2 - 4ac = 0$ ⇒ $(2-k)^2 - 4(2)(1) = 0$ ⇒ $4 + k^2 - 4k - 8 = 0$ ⇒ $k^2 - 4k - 4 = 0$ Again here, A= 1, B=-4, C = -4 D = $B^2 - 4AC = (-4)^2 - 4(1)(-4) = 16+16 = 32$ ∴ $\sqrt{D} = \sqrt{16\times 2} = 4\sqrt{2}$ ⇒ $k = \frac{-B\pm\sqrt{D}}{2A}$ ⇒ $k = \frac{-(-4)\pm 4\sqrt{2}}{2(1)}$ ⇒ A= $-\frac{4\pm 4\sqrt{2}}{2}$ ⇒ $k = 2\left(\frac{2\pm 2\sqrt{2}}{2}\right)$ ∴ A =2 + 2√2 or k = 2-2√2 **OR** If a student had walked 1 km/hr faster, he would have taken 15 minutes less to walk 3 km. Find the rate at which he was walking. **Sol.** Let the original speed of the student = x km/h . Increased speed = (x + **1**) km/h ∴ $\frac{3}{x} - \frac{3}{x+1} = \frac{15}{60}$ $\left[\because \text{Time} = \frac{\text{Distance}}{\text{Speed}},\ 15 \text{ mns} = \frac{15}{60} \text{ hrs.}\right]$ ⇒ $\frac{3x+3-3x}{x(x+1)} = \frac{1}{4}$ ⇒ x (x + 1) = 12 ⇒ $x^2 + x - 12 = 0$ ⇒ $x^2 + 4x - 3x - 12 = 0$ ⇒ x (x + 4) - 3 (x + 4) = 0 ⇒ (x + 4) (x - 3) = 0 ⇒ x + 4 = 0 or x - 3 = 0

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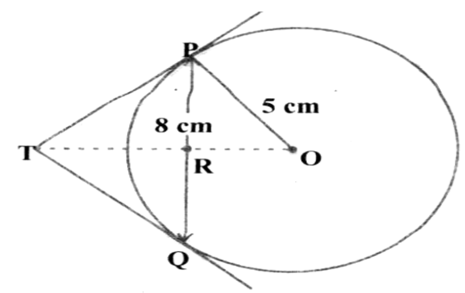
	⇒ x = - 4or x = 3 Rejecting x = - 4, because speed cannot be - ve ∴ His original speed was 3 km/h
Q.29	A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel partly filled with water. The diameter of the cylindrical vessel is 12 cm. If the sphere is exactly half submerged in water, by how much will the level of water rise in the cylindrical vessel. Ans.  Let level raised be H cm ∴ Volume of hemisphere = vol of cylinder (level raised by H cm) $\frac{2}{3}\pi r^3 = \pi R^2 H$ 1 $H = \frac{2}{3} \times \frac{3\times 3\times 3}{6\times 6}$ 1 = 0.5 cm 1
Q.30	PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T (see Fig.). Find the length TP.  Ans. 20 / 3 cm

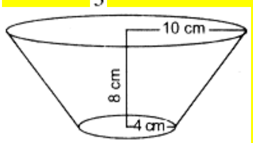
Q.31 Find the sum of all three digit numbers which leave the remainder 3 when divided by 5. Sol. The three digit numbers which when divided by 5 leave the remainder 3 are 103, 108, 113,..., 998 . Let their number be n . $\Rightarrow$ Then $t_n = a + (n-1)d \Rightarrow 998 = 103 + (n-1)5 \Rightarrow 998 = 103 + 5n - 5$ $\begin{bmatrix} \text{Here } a = 103 \\ d = 108 - 103 = 5 \end{bmatrix}$ $\Rightarrow 5n = 998 - 98 = 900 \Rightarrow n = 900/5 = 180$

Now, $S_n = \frac{n}{2}[a + l]$ $\begin{bmatrix} a = \text{first term} = 103 \\ l = \text{last term} = 998 \end{bmatrix}$

$\therefore S_{180} = \frac{180}{2}[103 + 998] = 90 \times 1101 = 99090$

Q.32 An open container made up of a metal sheet is in the form of a frustum of a cone of height 8 cm with radii of its lower and upper ends as 4 cm and 10 cm respectively. Find the cost of oil which can completely fill the container at the rate of Rs. 50 per liter. Also, find the cost of metal used, if it costs Rs. 5 per 100 cm^2. (Use $\pi = 3.14$) Sol. Height of container h = 8 cm ; Radius of the bases, R = 10 cm and r = 4 cm ; Slant heightl = $\sqrt{h^2 + (R - r)^2}$ $\sqrt{8^2 + (10-4)^2} = \sqrt{8^2 + 6^2} \Rightarrow \sqrt{64 + 36} = \sqrt{100} = 10$ cm

Volume of container $= \frac{1}{3}\pi h (R^2 + r^2 + Rr) = \frac{1}{3} \times 3.14 \times 8 (100+16+40)$ $cm^3 = \frac{1}{3} \times 3.14 \times 8(156)$



$= 1306.24 \text{ cm}^3 \Rightarrow \frac{1306.24}{1000}$ lit. ($\because$ 1000 cm^3 =1 lit.)

= 1.30624 lit. = 1.31 lit. (approx.) $\therefore$ Quantity of oil= 1.31 lit. Cost of oil = Rs. (1.31 × 50) = Rs. 65.50 Suface area of the container (excluding the upper end) = C.S. ar + ar of base = $\pi l(R + r) + \pi r^2 = \pi[l(R + r) + r^2]$ = 3.14 x [10(10 + 4)+16] = 3.14 x 156 = 489.84 cm^2 $\Rightarrow$ Cost of metal = Rs.$\left(489.84 \times \frac{5}{100}\right)$ = 24.492 = Rs. 24.49 (approx.)

Q.33 At a point on level ground, the angle of elevation of a vertical tower is

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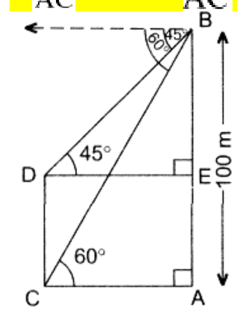
found to be such that its tangent is $\frac{5}{12}$. on walking 192 meters towards the tower, the tangent of the angle of elevation is $\frac{3}{4}$. Find the height of the tower. Ans h = 180m

OR

From the top of a building 100m high, the angles of depression of the top and bottom of a tower are observed to be 45° and 60° respectively. Find the height of the tower. Also find the distance between the foot of the building and the bottom of the tower. **Sol.** In right ABAC tan 60° $= \frac{AB}{AC} \Rightarrow \frac{100}{AC}$ = tan 60° $\Rightarrow$AC=$\left(\frac{100}{\sqrt{3}}\right)$ m $\therefore$ DE = AC=$\left(\frac{100}{\sqrt{3}}\right)$ m



In right ABED, $\frac{BE}{DE}$ = tan 45° $\Rightarrow \frac{BE}{DE} = 1 \Rightarrow$ BE = DE $\therefore$ BE $= \left(\frac{100}{\sqrt{3}}\right) \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{100\sqrt{3}}{3} \Rightarrow \frac{100 \times 1.732}{3}$ = 57.73 m [$\because \sqrt{3}$= 1.732] $\therefore$ Height of tower (CD) = AE = AB - BE = (100-57.73) m = **42.27 m** Distance between the foot of the building and the bottom of the tower (AC) = **57.73 m.**

Q.34 Two circle with center O and Q of radii 3cm and 4cm respectively intersect at two points P and Q such that OP and O'P are tangents to the two circles. Find the length of the common chord PQ.

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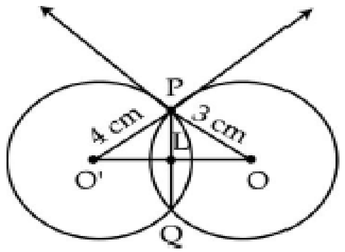
ANS:



O'P is tangent to a circle with a centre O' and radius 4 cm and OP is tangent to a Circle with Centre O and radius as 3 cm

$OP \perp O'P$

$\therefore \angle OPO' = 90°$

$OO' = \sqrt{4^2+3^2} = 5cm.$

Let $O'L = x$ and $OL = 5 - x$

As we know $PQ \perp OO'$

$PL^2 = 16 - x^2$ ---------(i)

and also $PL^2 = 3^2 - (5 - x)^2$ -----------(ii)

$\Rightarrow 16 - \cancel{x^2} = 9 - 25 + 10x - \cancel{x^2}$

$32 = 10x$

$x = 3.2cm$

$PL = \sqrt{4^2 - (3.2)^2}$

$= \sqrt{16 - 10.24}$

$= \sqrt{5.76} = 2.\text{lm}$

$= PQ = 2 \times 2.4 = 4.8cm$

$\because O'L \perp PQ \Rightarrow PQ = 2PL$ (perpendicular from centre to chord bisects chord

****

WINNER LOSE MUCH MORE OFTEN THAN LOSERS. SO IF YOU KEEP LOSING BUT YOU'RE STILL TRYING, YOU'RE RIGHT ON TRACK.

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