केन्द्रीय माध्यमिक शिक्षा बोर्ड, दिल्ली

Central Board of Secondary Education, Delhi

WITH GRAPH PAPER

Fictitious Roll No.

(To be entered by Board)

(परीक्षार्थी भरें To be filled in by the candidate)

परीक्षार्थी प्रश्न-पत्र के ऊपर लिखे कोड को दर्शाये गये बाक्स में ही लिखें
Candidate should write code no.as written on the top of the question paper in this box → 30/1

अतिरिक्त उत्तर-पुस्तिका (ओं) की संख्या
No. of supplementary answer-book (s) used → –

परीक्षा का नाम Name of the examination AISSE

कक्षा Class TENTH

विषय Subject MATHEMATICS - [041]

परीक्षा का दिन एवं तिथि
Day & Date of the Examination SATURDAY - 05-03-2011

उत्तर देने का माध्यम Medium of answering the paper ENGLISH

B D H S C

SECTION - A

1. (B) $-m, m+3$
2. (C) 15
3. (D) 35°
4. (C) 140°
5. (A) $8a$
6. (B) 21
7. (C) 25
8. (A) -8
9. (B) 26
10. (C) $\frac{12}{13}$

SECTION - B

11. $mx(x-7)+49=0$

$mx^2-7mx+49=0$

Here, $a=m$, $b=-7m$ and $c=49$

For an equation to have equal roots,

Discriminant $=0$

i.e $b^2-4ac=0$

$(-7m)^2 \cancel{(-7m)^2} - 4\times m\times 49 = 0$

4

$$49m^2 - 4m \times 49 = 0$$
$$49m(m-4) = 0$$
$$\Rightarrow \quad m = 0, +4$$

But if $m = 0$, then

eq. ① $\Rightarrow$ $49 = 0$ which is not true

$\therefore$ $m \neq 0$

$\therefore$ The required value of m is $\underline{\underline{4}}$

12. ~~Att~~ The two digit numbers divisible by 6 are:

12, 18, 24, 30 ... 96

Clearly this forms an A.P with

$a = 12$, $d = 6$ and $a_n = 96$

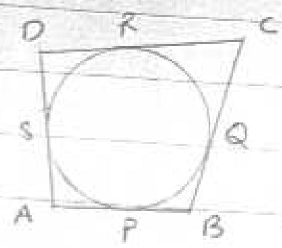
Now, $a_n = a + (n-1)d$

$$96 = 12 + (n-1)6$$
$$16 = 2 + (n-1)$$
$$14 = n-1$$
$$\text{or } n = 14+1 = 15$$

$\therefore$ 15 two-digit nos are divisible by 6.

13.

13 B.



Let ~~a~~ side AB touch circle at P, CB at Q, CD at R ~~at~~ and AD at S.

∵ tangents from an external point to a circle are equal,

AP = AS — (1)

BP = BQ — (2)

DR = DS — (3)

and CR = CQ — (4)

~~Adding~~ (1) + (2) + (3) + (4) ⇒

$\underbrace{AP + BP}_{AB} + \underbrace{DR + CR}_{DC} = AS + BQ + DS + CQ$

$= \underbrace{AS + DS}_{AD} + \underbrace{BQ + CQ}_{BC}$

i.e. 6 + 8 = AD + 9

∴ AD = 6+8−9 = 5 cm

14. Given: $AB = 7\,cm$

and $\frac{AP}{AB} = \frac{3}{5}$

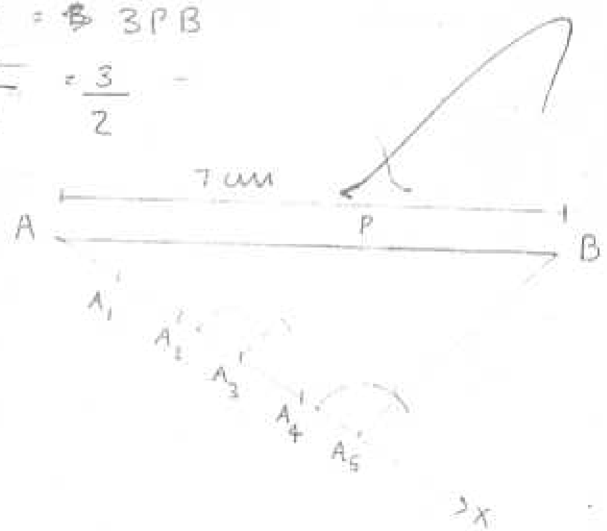
$\Rightarrow 5AP = 3AB$

$5AP = 3(AP + PB)$

$5AP = 3AP + 3PB$

$2AP = \cancel{B}\ 3PB$

or $\frac{AP}{PB} = \frac{3}{2}$



$\frac{AP}{AB} = \frac{3}{5}$

Steps of construction

i) Draw AB of length 7cm

ii) Make an acute angle BAX at A

iii) On ray AX, mark ~~pt~~ points A_1, A_2, A_3, A_4, A_5 such that $AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5$

iv) Join BA_5

v) From A_3 draw a line segment parallel to BA_5 intersecting AB at P.

<u>JUSTIFICATION</u>: ~~Now~~

$$\frac{AA_3}{A_3A_5} = \frac{3}{2} \quad \text{(by construction)}$$

∴ In $\triangle AA_5B$

$$\frac{AP}{PB} = \frac{AA_3}{A_3A_5} \quad \text{(by Basic Proportionality theorem)}$$

$$\therefore \frac{AP}{PB} = \frac{3}{2} \quad \text{or} \quad \frac{PB}{AP} = \frac{2}{3}$$

Now $\frac{AB}{AP} = \frac{AP+PB}{AP}$ ~~or $\frac{AP}{AB} = \frac{3}{5}$~~ $= 1 + \frac{PB}{AP} = 1 + \frac{2}{3} = \frac{5}{3}$ or $\frac{AP}{AB} = \frac{3}{5}$

15.

Given, side of square = 14 cm

radius r of each semicircle $= \frac{14}{2} = 7$ cm

Now perimeter of shaded region

$= 2 \times \text{side} + \frac{1}{2} \times \text{circumference of circle} \times 2$

$= 2 \times 14 + \frac{1}{2} \times 2\pi r \times 2$

$= 2 \times 14 + 2 \times \frac{22}{7} \times 7$

$= \cancel{2\times}\ 28 + 44$

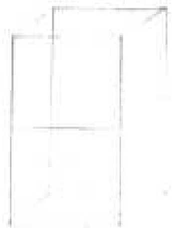
$= \underline{72 \text{ cm}}$

16. Given, volume of each cube $= 27 \text{ cm}$

i.e $\text{side}^3 = 27$

or $\text{side} = \sqrt[3]{27} = 3 \text{ cm}$

When two such cubes are joined together, surface area of resultant cuboid



$= 6 \times \text{side}^2 + 6 \times \text{side}^2 - 2 \times \text{side}^2$

$= 10 \times \text{side}^2$

$= 10 \times 3 \times 3 = \underline{90 \text{ cm}^2}$

17. Given, points $A(3, -1)$ and $B(11, y)$ with
(x_1, y_1) (x_2, y_2)

distance AB = 10 units

i.e $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2} = 10$

$$(x_2-x_1)^2+(y_2-y_1)^2 = 100$$
$$(11-3)^2+(y+1)^2 = 100$$
$$8^2+y^2+1+2y = 100$$
$$64+y^2+1+2y = 100$$
$$y^2+2y+65-100=0$$
$$y^2+2y-35=0$$
$$(y+7)(y-5)=0$$
$$\Rightarrow y=-7, +5$$

$\therefore$ when $y=-7$ or $+5$, distance AB = 10 units

18 Total ~~out~~ number of outcomes = 40

Out of them outcomes divisible by 5 are 5, 10, 15, 20, 25, 30, 35 and 40

i.e there are 8 favourable outcomes.

$\therefore$ P (a multiple of 5) = $\dfrac{\text{favourable no. of outcomes}}{\text{Total no. of outcomes}}$

$$= \frac{8}{40} = \frac{1}{5} = \underline{\underline{0.2}}$$

Section - C

19. $x^2 - 3\sqrt{5}x + 10 = 0$

Here $a = 1$, $b = -3\sqrt{5}$ and $c = 10$

∴ using quadratic formula

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$= \frac{3\sqrt{5} \pm \sqrt{(-3\sqrt{5})^2 - 4\times1\times10}}{2\times1}$$

$$= \frac{3\sqrt{5} \pm \sqrt{9\times5 - 4\times10}}{2}$$

$$= \frac{3\sqrt{5} \pm \sqrt{45-40}}{2}$$

$$= \frac{3\sqrt{5} \pm \sqrt{5}}{2}$$

$$= \frac{\sqrt{5}(3\pm1)}{2}$$

$$= \frac{\sqrt{5}(3+1)}{2} \text{ or } \frac{\sqrt{5}(3-1)}{2}$$

$$= \frac{4\sqrt{5}}{2} \text{ or } \frac{2\sqrt{5}}{2}$$

$= \sqrt{5}$ and $\sqrt{5}$

20. Given $a_4 = 9$

i.e $a + (4-1)d = 9$

$a + 3d = 9$ — (1)

Also $a_6 + a_{13} = 40$

$\Rightarrow a + (6-1)d + a + (13-1)d = 40$

$a + 5d + a + 12d = 40$

$2a + 17d = 40$ — (2)

(1) × 2 => $2a + 6d = \cancel{40}\ 18$ — (3)

(2) − (3) => $11d = 22$

$d = 2$

Substituting in (1), we get

$a + 3(2) = 9$

$a = 9 - 6 = 3$

∴ the required A P is

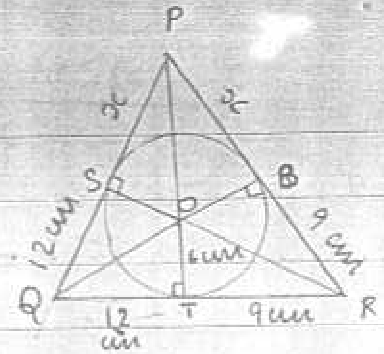
$a,\ a+d,\ a+2d \ldots$

i.e. $3,\ 3+2,\ 3+4 \ldots$

=> $3, 5, 7, 9, \ldots$

12

21.



Given, Δ PQR circumscribing circle with centre O and radius 6 cm,

T is the point of contact of side QR with circle such that QT = 12 cm and TR = 9 cm

Let PQ touch circle at S and PR at B

$\because$ tangents from an external point to a circle are equal,

$QS = QT = 12$ cm

$BR = TR = 9$ cm

and let $PS = PB = x$ cm

Given area of $\Delta PQR = 189\ cm^2$

i.e. $ar(OQR) + ar(ORP) + ar(OQP) = 189$

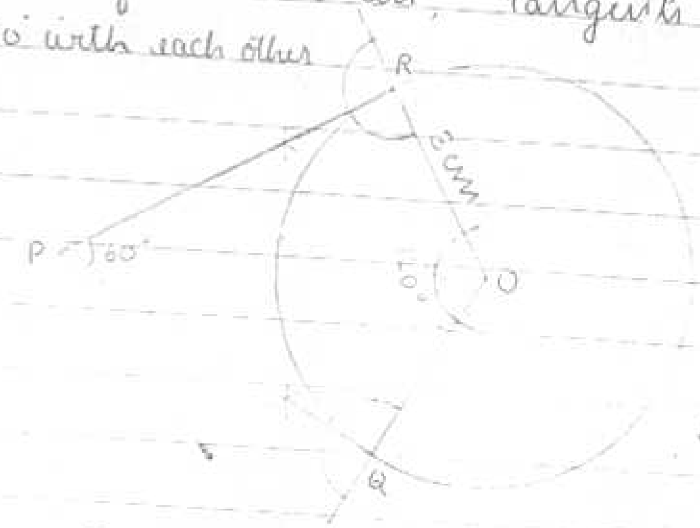
$\frac{1}{2}(21 \times 6) + \frac{1}{2}(x+9)6 + \frac{1}{2}(12+x)6 = 189$

$\frac{6}{2}[21 + x + 9 + 12 + x] = 189$

$$3(42+2x) = 189$$
$$42+2x = 63$$
$$2x = 63-42 = 21$$
$$x = \frac{21}{2} = 10.5\text{ cm}$$

Now side $PQ = x + 12 = 10.5+12 = 22.5$ cm
and $PR = x + 9 = 10.5+9 = 19.5$ cm

22. Given: a circle of radius 3 cm, tangents drawn from an external pt making ∠60° with each other



Steps of construction
1) Draw a circle with centre O and radius OR = 3 cm
2) At centre O, make ~~an angle of 120° a~~ ∠ROQ = 120°

such that OQ is another radius.

iii) At points R and Q make an angle of 90° each ~~....~~ and extend the rays to meet at P.

Now PR and PQ are the required tangents inclined to each other at ∠60°.

Justification ;

In quadrilateral PROQ

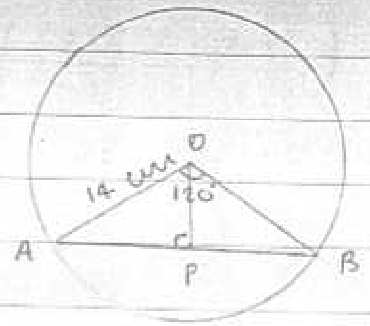
$$\left.\begin{aligned} \angle PRO &= 90^\circ \\ \angle ROQ &= 120^\circ \\ \angle PQO &= 90^\circ \end{aligned}\right\} \text{by construction}$$

Also $\angle RPQ$ ~~$\angle PRQ$~~ $+ \angle PRO + \angle ROQ + \angle PQO = 360^\circ$ (angle sum property)

$\angle RPQ$ ~~$\angle PRQ$~~ $+ 90^\circ + 120^\circ + 90^\circ = 360^\circ$

$\therefore \angle RPQ$ ~~$\angle PRQ$~~ $= \underline{\underline{60^\circ}}$

23.



Given chord AB of circle with centre O ~~such that~~ with OA = OB = 14 cm and $\angle AOB = 120^\circ$

Construction: Draw $OP \perp AB$

Now, in $\triangle OAP$ and $\triangle OBP$

OA = OB (each 14 cm) [radii of same circle]

OP = OP [common]

$\angle OPA = \angle OPB$ (each 90°) [by construction]

$\therefore$ $\triangle OAP \cong \triangle OBP$ (by RHS)

$\Rightarrow$ $\angle AOP = \angle BOP$ (C.P.C.T)

Also $\angle AOP + \angle BOP = 120^\circ$

$\therefore$ $\angle AOP = \angle BOP = 60^\circ$

and $AP = BP = \frac{1}{2} AB$ (C.P.C.T)

In $\triangle$ AOP

$$\sin 60^\circ = \frac{AP}{14}$$

$$\frac{\sqrt{3}}{2} = \frac{AP}{14}$$

or $AP = 7\sqrt{3}$ cm

and $\cos 60^\circ = \frac{OP}{14}$

$$\frac{1}{2} = \frac{OP}{14}$$

or $OP = 7$ cm

Now area of minor segment

$= $ area of sector of $\theta = 120^\circ$ $-$ area of Δ OAB

$= \frac{\theta}{360} \times \pi r^2 - \frac{1}{2} \times$ base $\times$ height

$$= \frac{120}{360} \times \frac{22}{7} \times 14 \times 14 - \frac{1}{2}\left[(7\sqrt{3}) \times 2\right] \times 7$$

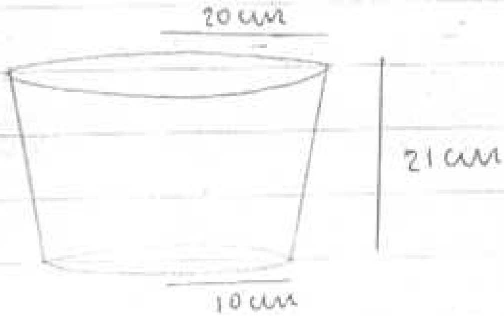
$$= \frac{1}{3} \times 22 \times 2 \times 14 - 7\sqrt{3} \times 7$$

$$= 7\left(\frac{88}{3} - 7\sqrt{3}\right)$$

$= 7\left(\frac{88}{3} - 12.11\right)$

$= 7\left(\frac{88 - 36.33}{3}\right)$

$= \frac{7(51.67)}{3} = \frac{361.69}{3} = 120.56\bar{3}\ cm^2$

24. 

~~Capaci~~ Given $h = 21$ cm, $r_1 = 20$ cm, $r_2 = 10$ cm

Capacity of bucket $= \frac{1}{3}\pi h\left(r_1^2 + r_2^2 + r_1 r_2\right)$

$= \cancel{8}\ \frac{1}{3} \times \frac{22}{7} \times 21\left(400 + 100 + 200\right)$

$= 22\ (700)\ cm^3$

$= \frac{22 \times 700}{1000}$ litres

Now cost of 1 litre of milk = Rs 30

$\therefore$ Cost of $\frac{22 \times 700}{1000}$ litres of milk

$= \frac{22 \times 700}{1000} \times 30$

$= 22 \times 7 \times 3$

$= 66 \times 7$

$=$ Rs 462

$\begin{array}{r} 66 \times \\ 7 \\ \hline 462 \end{array}$

25. A $(-5, 8)$ ———— P $(x, 4)$ ———— B $(4, -10)$

Here, $x_1 = -5$, $x_2 = 4$, $y_1 = 8$, $y_2 = -10$

Let P divide AB in the ratio $m_1 : m_2$

Then by section formula

$$P(x, 4) = \left(\frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}, \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2} \right)$$

$$(x, 4) = \left(\frac{4m_1 - 5m_2}{m_1 + m_2}, \frac{-10m_1 + 8m_2}{m_1 + m_2} \right)$$

$$\Rightarrow 4 = \frac{-10m_1 + 8m_2}{m_1 + m_2}$$

$$4m_1 + 4m_2 = -10m_1 + 8m_2$$

$$12m_2 = 6m_1$$

$$2m_2 = m_1$$

$$\text{or } \frac{m_1}{m_2} = \cancel{\frac{5}{8}}\ \frac{2}{1}$$

$$\text{Now } x = \frac{2(4) + 1(-5)}{2+1}$$

$$= \frac{8-5}{3} = \frac{3}{3} = 1$$

∴ P divides AB in ratio 2 : 1 and value of x is 1

$$14m_1 = 4m_2$$

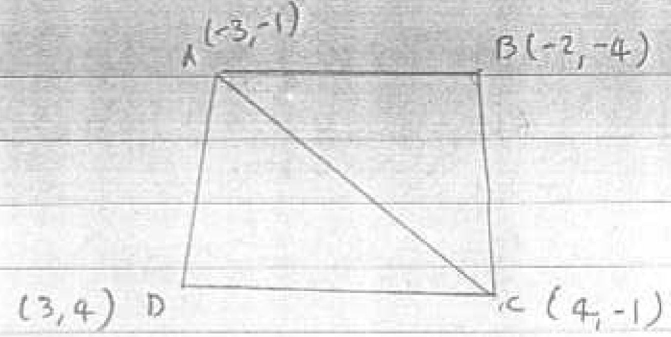
$$\frac{m_1}{m_2} = \frac{4}{14} = \frac{2}{7}$$

$$\text{Now, } x = \frac{2(4) + 7(-5)}{2+7}$$

$$= \frac{8-35}{9} = \frac{-27}{9} = -3$$

∴ P divides AB in ratio 2 : 7 and the value of x is -3

26.



Using section formula,

Area of $\Delta ABC = \frac{1}{2}\left[x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)\right]$

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

$= \frac{1}{2}\left[-3(-3) - 2(0) + 4(3)\right]$

$= \frac{1}{2}\left[9+0+12\right]$

$= \frac{21}{2}$ sq. units

and ar $(ADC) = \frac{1}{2}\left[x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)\right]$

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

$$= \frac{1}{2}\left[-3(5) + 3(0) + 4(-5)\right]$$

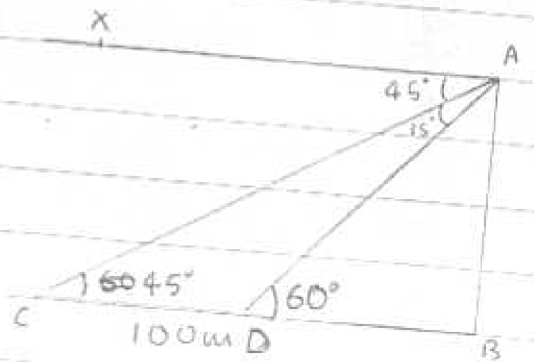
$$= \frac{1}{2}\left[-15 + 0 - 20\right]$$

$$= \left|\frac{-35}{2}\right| = \frac{35}{2} \text{ sq. units.}$$

Now, $ar(ABCD) = ar(ABC) + ar(ADC)$

$$= \frac{21+35}{2} = \frac{56}{2} = \underline{\underline{28 \text{ sq. units}}}$$

27.



Let AB represent the tower, C and D the two cars such that C, D and B are on same line.

Given $CD = 100$ m, $\angle ADB = \angle XAD = 60°$ and $\angle ACB = \angle XAC = 45°$

Now $\tan 60° = \frac{AB}{BD}$

$$\sqrt{3} = \frac{AB}{BD}$$

or $\sqrt{3}\,BD = AB$

$$BD = \frac{AB}{\sqrt{3}} \quad \text{— (1)}$$

and $\tan 45° = \dfrac{AB}{\cancel{CD+BD}\ CB}$

$$1 = \frac{AB}{CD+BD}$$

$$CD + BD = AB$$

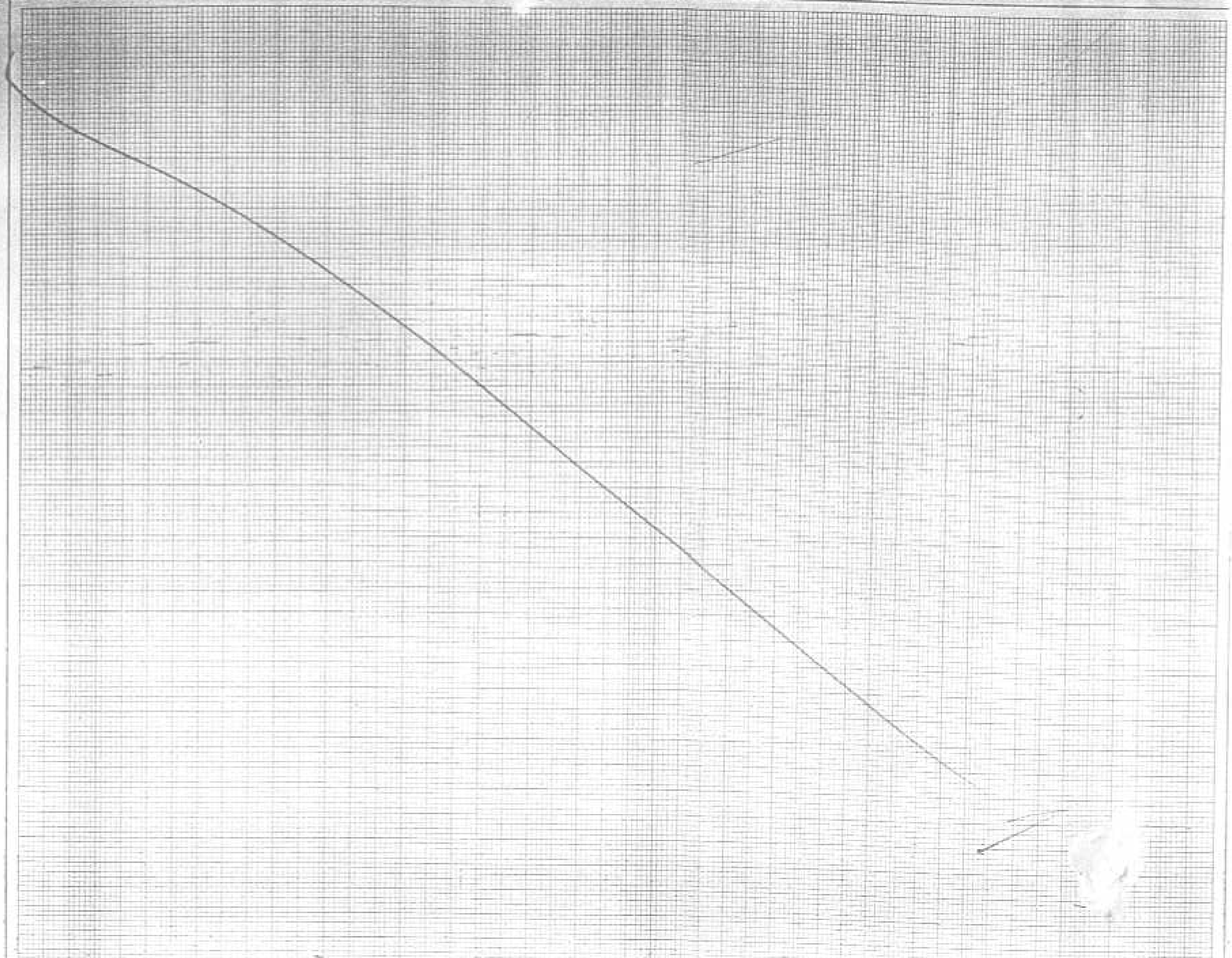
or $\cancel{C}\ 100 + \dfrac{AB}{\sqrt{3}} = AB$ (from (1))

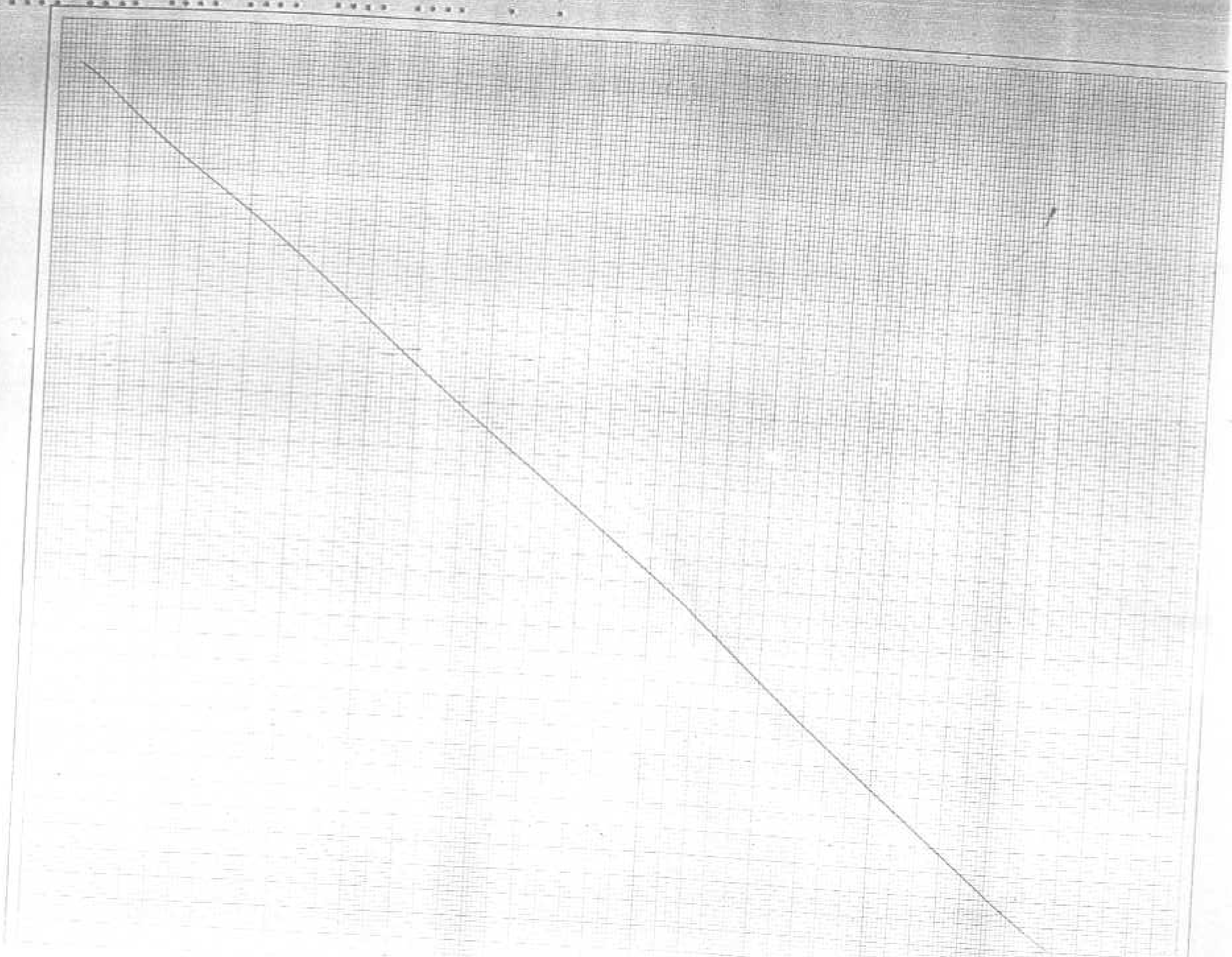
$$100 = AB\left(1 - \frac{1}{\sqrt{3}}\right)$$

$$= AB\left(\frac{\sqrt{3}-1}{\sqrt{3}}\right)$$

or $AB = \dfrac{100\sqrt{3}}{\sqrt{3}-1}$

$$= \frac{173}{.73} = \frac{17300}{73} = 236.9\ m$$





= 237 m (approx)

28 ~~When two dice are thrown, all possible outcomes~~

Total no. of ~~out~~ outcomes = 80

Out of these perfect squares are 1, 4, 9, 16, 25, 36, 49, 64,

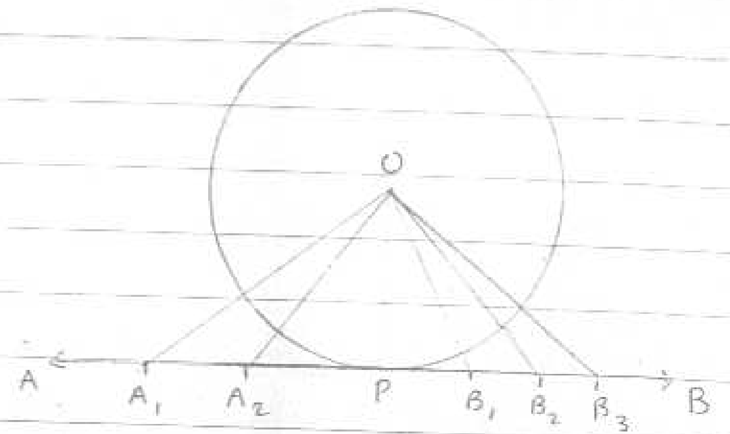
i.e. there are 8 favourable outcomes.

$\therefore$ P (a perfect sq.) = $\dfrac{\text{no. of favourable outcomes}}{\text{total no. of outcomes}}$

$= \dfrac{8}{80} = \dfrac{1}{10} = \underline{\underline{0.1}}$

Section - D

29.



Given : a circle with centre O, AB is a tangent with point of contact P

To Prove that : $OP \perp AB$

Construction : take points A_1, A_2, B_1, B_2, and B_3 on AB.
Join OA_1, OA_2, OB_1, OB_2 and OB_3

Proof : length OP = r (radius of circle)
$OA_1 > r$ (as A_1 lies outside circle)
$OA_2 > r$ (as A_2 lies outside circle)
$OB_1 > r$ (as B_1 lies outside circle)
$OB_2 > r$ (as B_2 lies outside circle)
$OB_3 > r$ (as B_3 lies outside circle)

This is true for any point ~~of~~ on line AB ~~any~~ except P.
∴ P is the shortest distance ~~of at~~ from centre O to tangent AB.
⇒ $OP \perp AB$ as the shortest distance between a line and a point is the perpendicular

from the point to the line.

i.e. Tangent at a point of a circle is perpendicular to the radius through the point of contact.

Hence proved//

30 Given. $a = 8$, $a_n = 350$ and $d = 9$

Now,

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

$$350 = 8 + (n-1)9$$

$$342 = (n-1)9$$

$$38 = n-1$$

$$\text{or } n = \underline{\underline{39}}$$

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

$$= \frac{39}{2}(8 + 350)$$

$$= \frac{39(358)}{2} = 39 \times 179 = 6981$$

$\therefore$ there are $\underline{\underline{39}}$ terms in the A.P and their sum is $\underline{\underline{6981}}$

das

30

31.

Let the speed of the train be x km/hr
Distance travelled = 180 km.
~~Increased~~ ~~spe~~ time taken to travel
180 km at x km/hr = $\frac{180}{x}$ hrs

Increased speed = $(x+9)$ km/hr
$\therefore$ the ~~new~~ time taken at this speed
to cover the distance = $\frac{180}{x+9}$

According to the question

$$\frac{180}{x} = \frac{180}{x+9} + 1$$

$$\frac{180}{x} - \frac{180}{x+9} = 1$$

$$180\left(\frac{1}{x} - \frac{1}{x+9}\right) = 1$$

$$180\,(x+9-x) = x(x+9)$$

$$180 \times 9 = x^2 + 9x$$

$x^2 + 9x - 180 \times 9 = 0$

$x^2 + 45x - 36x - 180 \times 9 = 0$

$x(x+45) - 36(x+45) = 0$

$(x-36)(x+45) = 0$

$\Rightarrow x - 36 = 0$ or $x + 45 = 0$

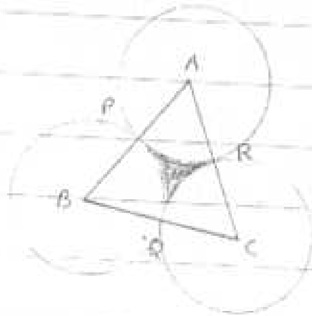
$\Rightarrow x = 36$ or -45

$\because$ speed cannot be negative, -45 is rejected

$\therefore$ The speed of train is 36 km/hr.

~~32~~

32.



Given: Three circles with centres A, B, and C and radius 3.5 cm each touching each other at points P, Q and R as in figure.

To find: area of shaded region.

$\because$ the line joining the centres of ~~tott~~ two circles touching externally passes through their point of contact,

~~A,P,B~~ A, P and B are collinear.

similarly, B, Q, C are collinear

and points ~~and~~ A, R, C are collinear.

Now AB = $r + r = 2r = \cancel{\pi}\ 2 \times 3.5 = 7$ cm

BC = $r + r = 2r = 2 \times 3.5 = 7$ cm

AC = $r + r = 2r = 2 \times 3.5 = 7$ cm

i.e. AB = BC = AC

or ΔABC is equilateral.

$\therefore \angle A = \angle B = \angle C = 60^\circ$

Now area of shaded region = area of ΔABC − area of 3 sectors of radius 3.5 cm and $\theta = 60^\circ$

$$= \frac{\sqrt{3}}{4} (\text{side})^2 - \frac{\theta}{360} \times \pi r^2 \times 3$$

$$= \frac{\sqrt{3}}{4} \times (7)^2 - \frac{60}{360} \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 3$$

$$= \frac{49\sqrt{3}}{4} - \frac{11 \times 7}{4}$$

$$= \frac{7}{4}(7\sqrt{3} - 11)$$

$$= \frac{7}{4}(12.124 - 11)$$

$$= \frac{7(1.124)}{4} = 7 \times 0.281$$

$$= \underline{\underline{1.967}}\ cm^2$$

$$\begin{array}{r} 1.73 \times \\ 7 \\ \hline 21 \\ \\ 1.732 \times \\ 7 \\ \hline 12.124 \\ \\ .281 \times \\ 4 \\ \hline 1.124 \\ \\ .281 \times \\ 7 \\ \hline 1.967 \end{array}$$

33. Given, length of cuboidal pond $l = 50\,m$
and breadth $b = 44\,m$

Required height of water in pond $h = 21\,cm = \frac{21}{100}\,m$

Also diameter of pipe $= 14\,cm = \frac{14}{100}\,m$
radius of pipe $= \frac{7}{100}\,m$

Rate of flow of water $= 15\,km/hr = \frac{15000}{60}\,m/min$

Let the time taken by pipe ~~water~~ to rise level of water in pond to 21 cm be x min then, height H of water column in pipe in x minutes $= \frac{15000}{60} \times x$ m

$\because$ water from pipe is transferred into pond, its volume remains same inside both.

i.e. $\pi r^2 h = l \times b \times h$

$\frac{22}{7} \times \frac{7}{100} \times \frac{7}{100} \times \frac{15000}{60} \times x = 50 \times 44 \times \frac{21}{100}$

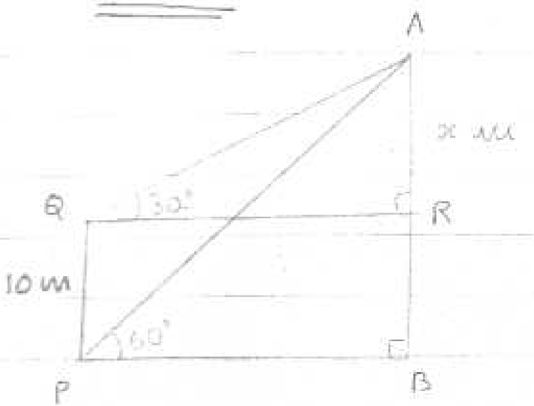
or $x = 6 \times 10 \times 2$ minutes

$= 120$ minutes

$\therefore$ the time taken by the pipe is 120 minutes

or $\frac{120}{60}$ i.e 2 hours

34.



Let AB represent the tower, P a point on ground such that $\angle APB = 60^\circ$, Q ~~at~~ a point 10 m above P and R a point 10 m above B such that ~~$\angle Q$~~ $\angle AQR = 30^\circ$.

From figure $BR = PQ = 10\,m$
and $QR = PB$

Let AR be x m ~~and~~
Then $\tan 30^\circ = \frac{AR}{QR} = \frac{x}{QR}$

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

or $QR = x\sqrt{3}$

$PB = x\sqrt{3}$ $[\because QR = PB]$

Also $\tan 60 = \frac{AB}{PB} = \frac{\cancel{AB}\ AR + RB}{PB}$

$$\sqrt{3} = \frac{x + 10}{x\sqrt{3}}$$

then, height H of water column ~~of~~ in pipe in x minutes $= \frac{15000}{60} \times x$ m

$\because$ water from pipe ~~in~~ is transferred into pond, its volume remains same inside both

i.e. $\pi r^2 h = l \times b \times h$

$$\frac{22}{7} \times \frac{7}{100} \times \frac{7}{100} \times \frac{15000}{60} \times x = 50 \times 44 \times \frac{21}{100}$$

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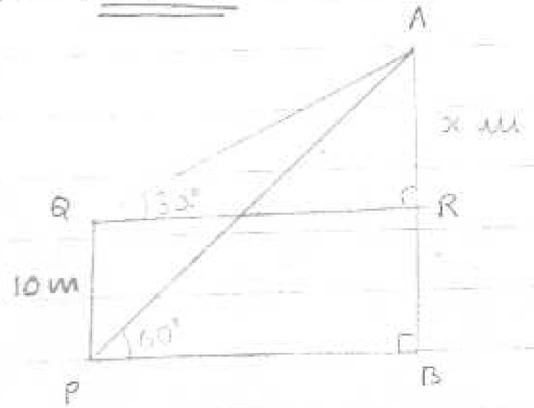

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or $QR = x\sqrt{3}$

$PB = x\sqrt{3}$ $\quad [\because QR = PB]$

Also $\tan 60 = \frac{AB}{PB} = \frac{\cancel{AB}\; AR + RB}{PB}$

$$\sqrt{3} = \frac{x + 10}{x\sqrt{3}}$$

$x + 10 = 3x$

or $10 = 2x$

or $x = 5$ m

Now, tower height $= x + 10$

$= 5 + 10$

$= \underline{15 \text{ m}}$