ASSIGNMENT OF UNIT -1

Q1] A rectangular plot of land area 0.45 hectare is represented on a certain map by a similar rectangle of 5 square centimeters. Calculate the R.F. of the scale .Also draw a scale to read up to single meter and long enough to measure upto 400 meters. 1 Hectare = 10,000 square meters. [**Nov. 2019**]

Q2] A cycle wheel of 50 cm diameter rolls over a culvert of 175cm diameter. Draw the path traced out by a point on the circumference of the cycle wheel for one complete revolution.

Q3] In a map of Bhopal, a distance of 36 km between two localities is shown by a line of 45 cm long. Calculate the RF and construct a plain scale to read kilometers and hectometer. Show a length of 9.3 km if maximum length is 10 km. [**JUNE -2020**]

Q4] A room of 1728 m3 volume is shown by a cube of 216 cm3 volume. Find R.F. and construct a plain scale to measure upto 42 m. Mark a distance of 22 m on the scale.

Q5] A regular pentagonal plate of 20 mm side is fixed at its centre. An inelastic rope is circumscribed along the perimeter of the pentagonal. Draw the path of free end of the rope when it is unwounded keeping, tight for one complete turn.

Q6] a) What is the difference between an enlarging scale and a reducing scale?
b) Construct s diagonal scale to measure Kilometers, hectometers and decimeters. R.F. = 1/50,000 and mark on it 6km, 4 hectometers and 3 decimeters.

Q7] Construct a scale of R.F. =1:27 showing yards, feet and inches and long enough to measure up to 6 yards. Show the length of 5 yards 2 feet 9 inches on it. **[JUNE 2016]**

Q8] On a map of a city, a distance of 30 km between two localities is shown by a distance of 9 cm. Calculate R.F. of scale and construct a plain scale to read Km and hectometer upto 100 Km. Show on it 63 Km. [**DEC. 2016**]

Q9] A circle of 50 mm diameter rolls on a horizontal line for a half revolution and then on a vertical line for another half revolution. Draw the curve traced out by a point *P* on the circumference of the circle.[**Prob 6.16** of Agarwal and Agarwal]

Q10] Show by means of a drawing that when the diameter of the directing circle is twice that of the generating circle, the hypocycloid is a straight line. Take the diameter of the generating circle equal to 50 mm. [**Prob 6.18** of Agarwal and Agarwal]

MUKUND KUKREJA AIML-I ASSIGNMENT

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$$RF = \frac{DL}{AL} = \frac{\sqrt{5\ cm^2}}{\sqrt{0.45 \times 10^8\ cm^2}}$$

$$= \frac{\sqrt{5}}{\sqrt{45}} \times \frac{1\ cm}{10^4\ cm}$$

$$\boxed{RF = \frac{1}{3000}}$$

max length = 400 m

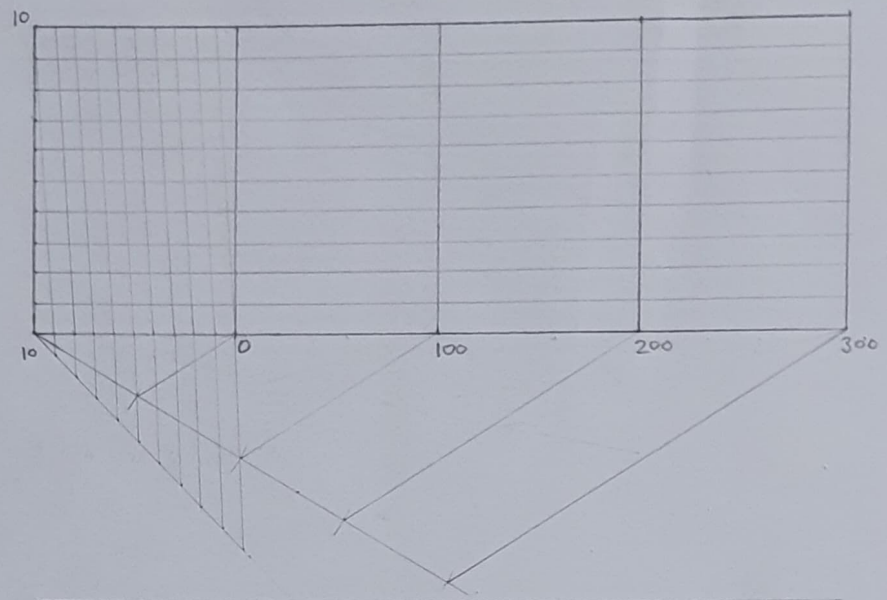
$$LoS = RF \times \text{max length} = \frac{1}{3000} \times 400 \times 100\ cm$$

$$\boxed{LoS = 13.3\ cm}$$

400 m = 4p × 100 m

100 m = 10p × 10 m

10 m = 10p × 1 m



Q3) In a map of Bhopal, a distance of 36 km between two localities is shown by a line of 45 cm long. Calculate the RF and construct a plain scale to read kilometers and hectometer. Show a length of 9.3 km if maximum length is 10 km.

$$RF = \frac{DL}{AL} = \frac{45\ cm}{36 \times 10^5\ cm} = \boxed{\frac{1}{80000}}$$

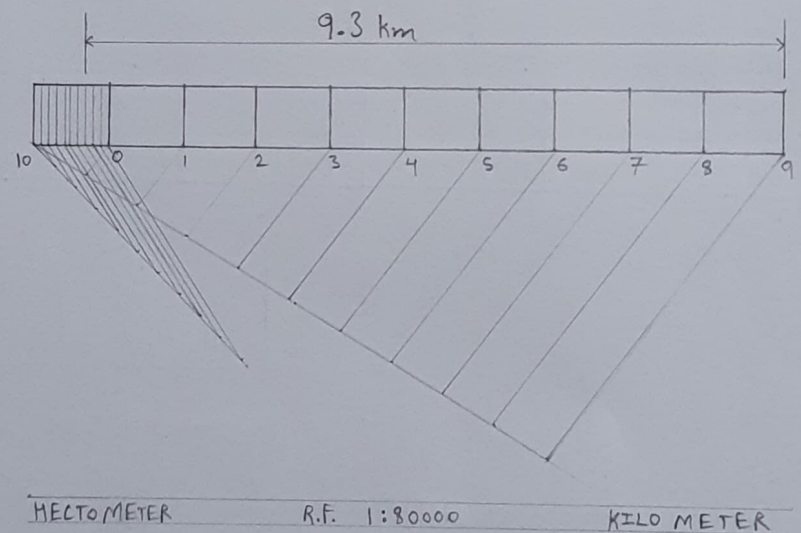
max length = 10 km

$$LoS = \frac{1}{80000} \times 1000000\ cm$$

$$\boxed{LoS = 12.5\ cm}$$

10 Km = 10p × 1 Km

1 Km = 10p × 1 Hm



IT OF UNIT - 1

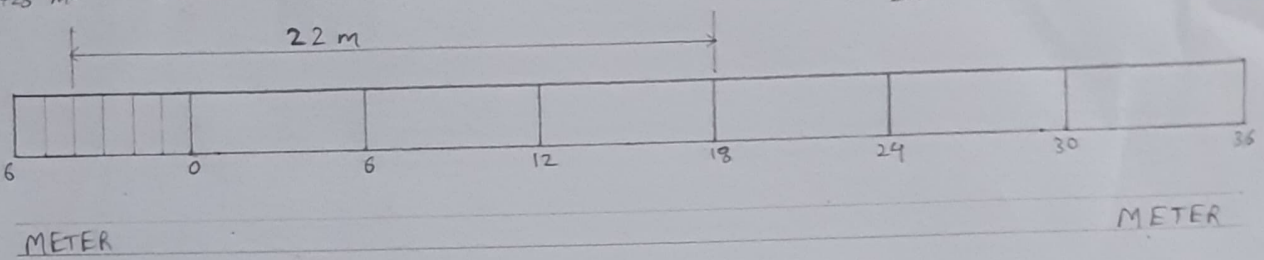
Q4) A room of 1728 m^3 volume is shown by a cube of 216 cm^3 volume. Find R.F. and Construct a plain scale to measure upto 42 m. Mark a distance of 22 m on the Scale.

$RF = \frac{DL}{AL} = \sqrt[3]{\frac{216\ cm^3}{1728\ m^3}} = \frac{6\ cm}{12\ m} = \frac{1\ cm}{200\ cm} \Rightarrow \boxed{RF = 1/200}$

max length = 42m

$LOS = \frac{1}{200} \times 4200\ cm = \boxed{21\ cm}$

4 m = 7 px for
6 m = 5 px / m



Q2) A cycle wheel of 50mm diameter rolls over a culvert of 175 mm diameter. Draw the path traced out by a point on the circumference of the cycle wheel for one complete revolution.

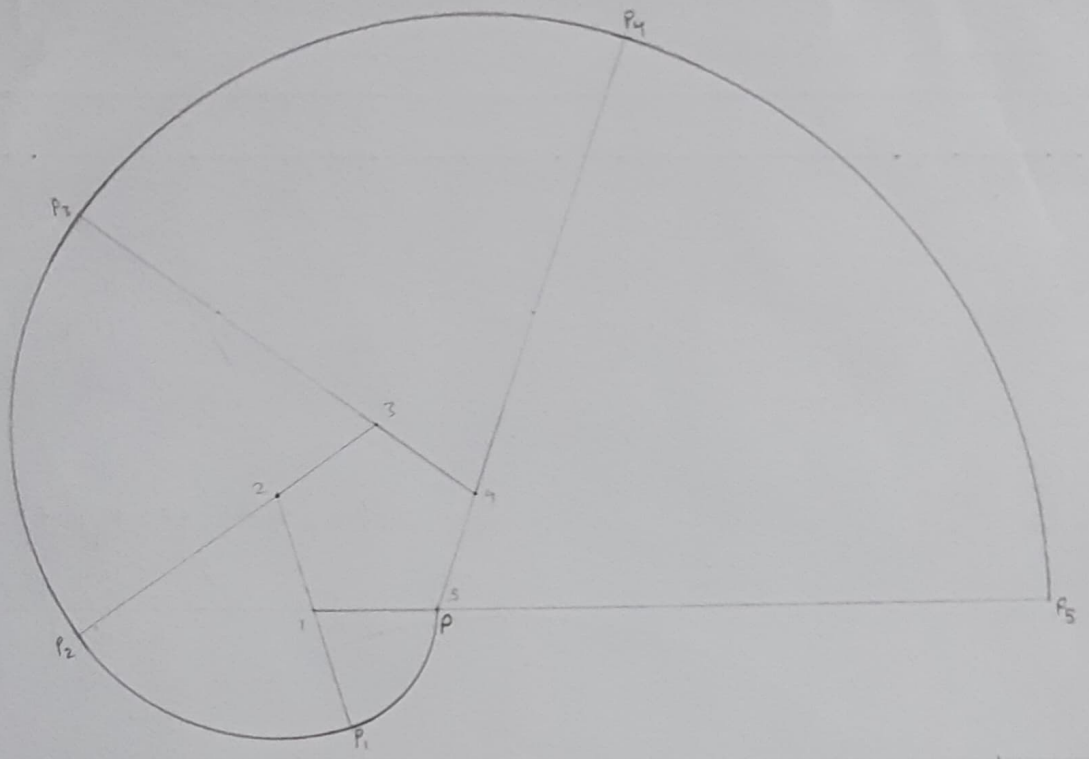
r = 25mm

R = 87.5 mm

$\theta = \frac{r}{R} \times 360 = \frac{25}{87.5} \times 360$

$\boxed{\theta = 102.85}$

Q5) A regular pentagonal plate of 20 mm side is fixed at its centre. An inelastic rope is circumscribed along the perimeter of pentagonal. Draw the path of free end of the rope when it is unwounded keeping, tight for one complete turn.



Q6) a) What is difference between an enlarging scale & a reducing scale?

Ans Enlarging Scale means that drawing is larger than the actual object therefore the representative fraction will be greater than unity i.e R.F. > 1.

* For reducing scale the representative fraction is less than unity. i.e R.F < 1

b) Construct diagonal scale to measure kilometres, hectometers & decametres, RF = 1/50000 and mark on it 6 Km, 4 hectometers and 3 decametres.

$$RF = \frac{1}{50,000}$$

Let max length = 7 Km

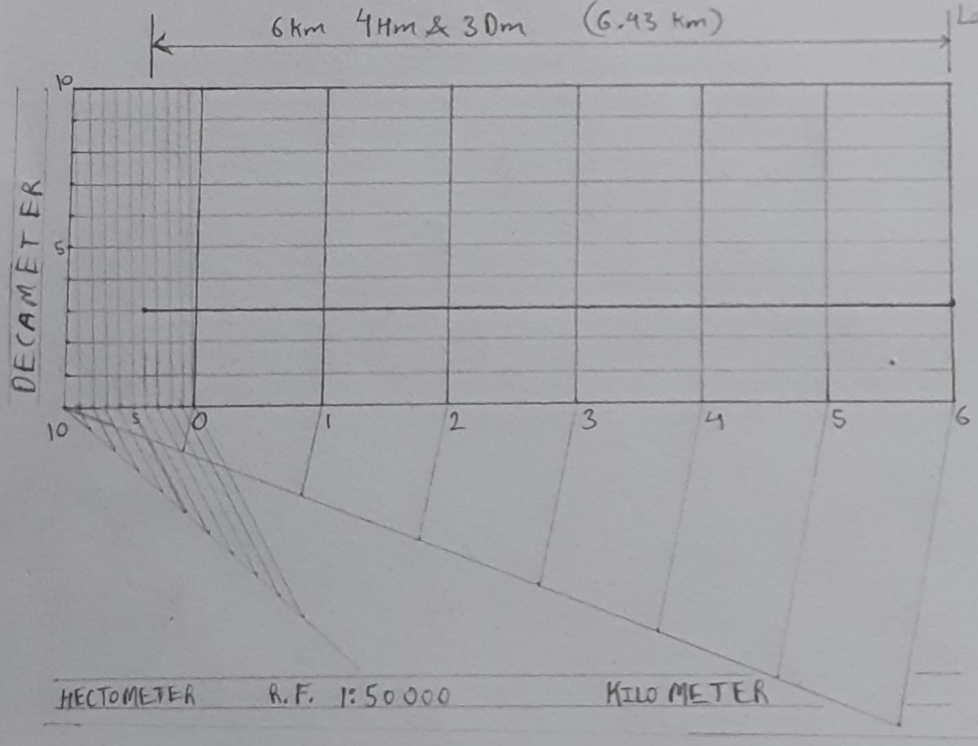
$$\therefore LOS = \frac{1}{50,000} \times 700000$$

LOS = 14 cm

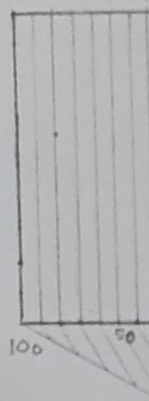
7 Km = 7 parts × 1 Km

1 Km = 10 parts × 1 Km

1 Hm = 10 parts × 1 Dm



Q8)



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b) On a m

R.F. of

RF = D

Max le

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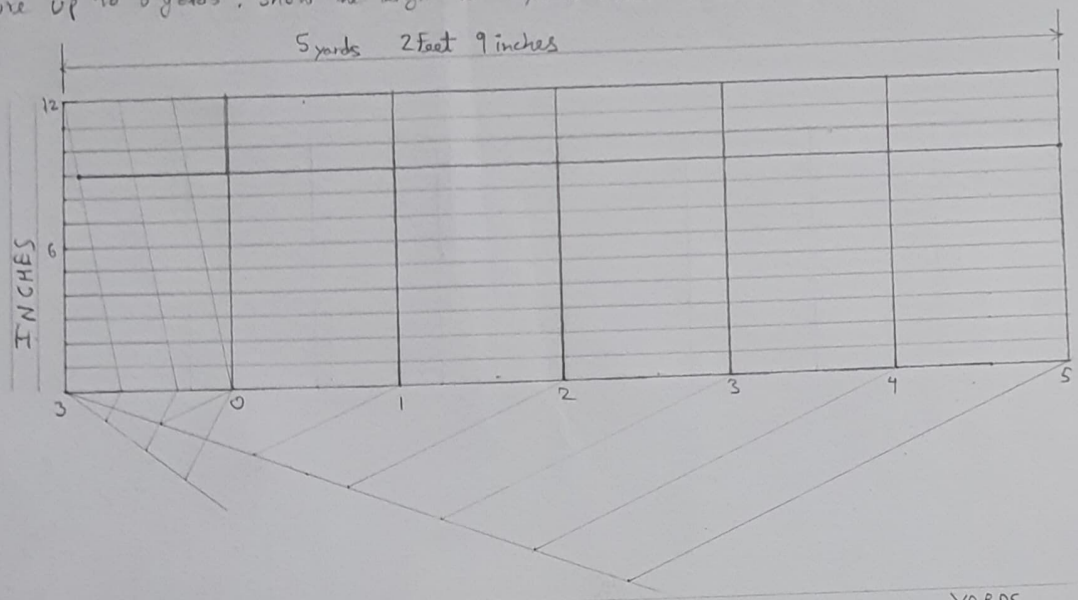


R.F. 1:27

$RF = \frac{1}{27}$

max length = 6 yards

$LoS = \frac{1}{27} \times 216$ inches

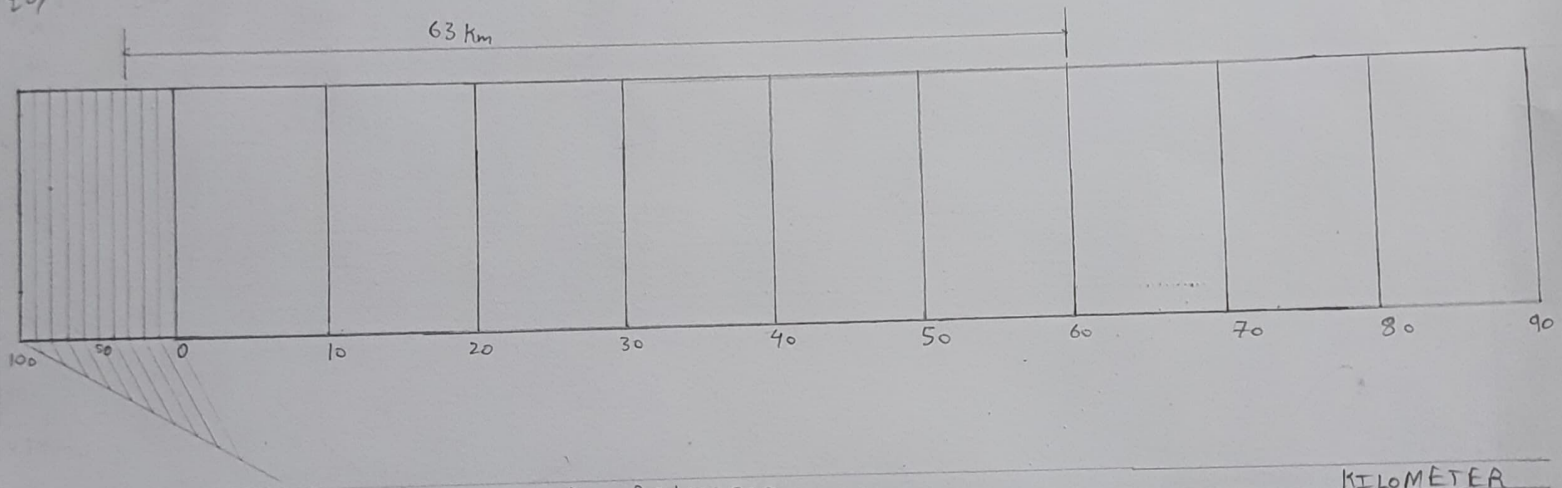
LoS = 8 inches

6 yd = 6 p × 1 yd

1 yd = 3 p × 1 ft

1 ft = 12 inches

Q8)



R.F. 3 : 1000000

P) On a map of a city, a distance of 30 km b/w two localities is shown by a distance of 9 cm. Calculate R.F. of scale and construct a plain scale to read km & hectometer upto 100 km. Show on it 63 km.

$RF = \frac{DL}{AL} = \frac{9\text{ cm}}{\frac{30}{10} \times 10^5\text{ cm}} = \boxed{\frac{3}{1000000}}$

100 km = 10 parts × 10 km

1 part = 10 km = 100 hm = 10 parts × 10 Hm

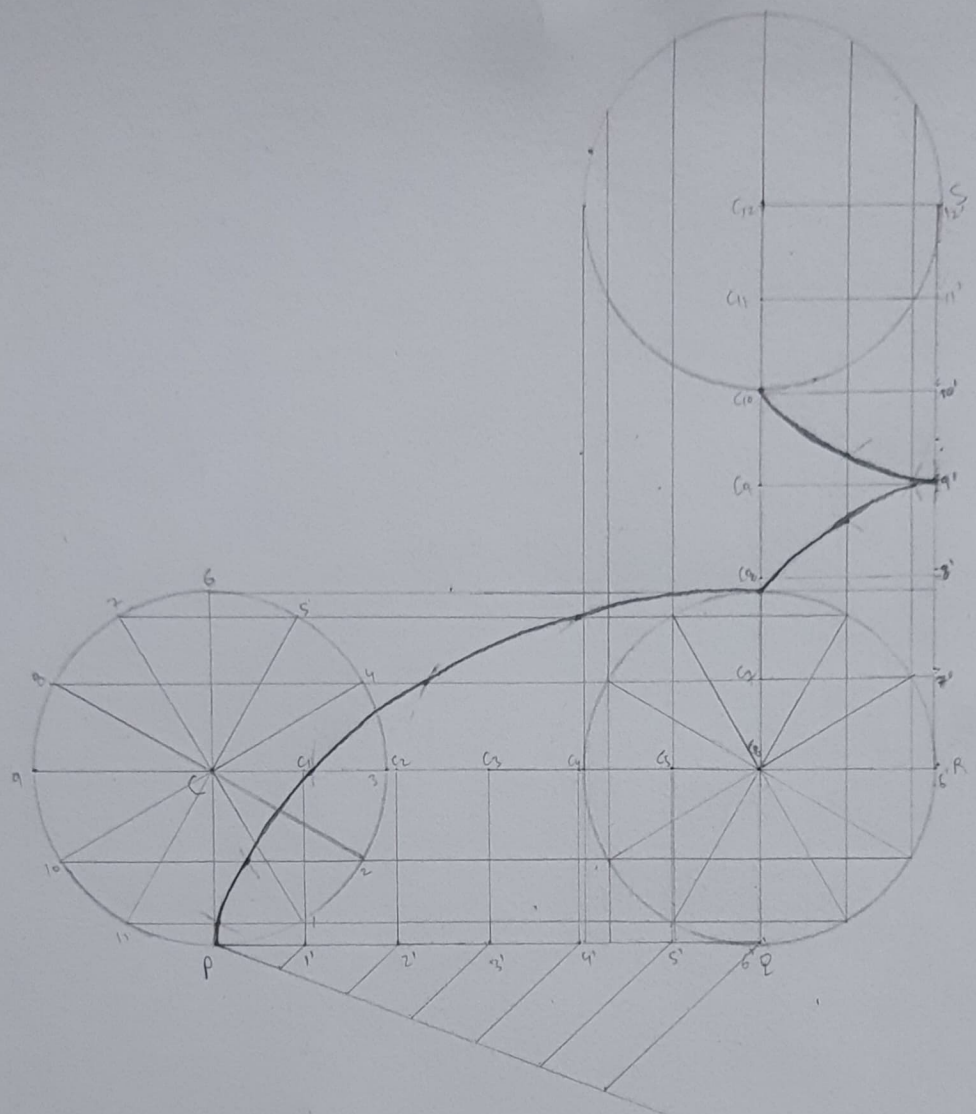
Max length = 100 km

$LoS = \frac{3}{1000000} \times 100 \times 100000\text{ cm} = \boxed{30\text{ cm}}$

Q9) A circle of 50 mm diameter rolls on a horizontal line for a half revolution & then on a vertical line for another half revolution. Draw the curve traced out by a point P on the circumference of circle.

$r = 50$ mm

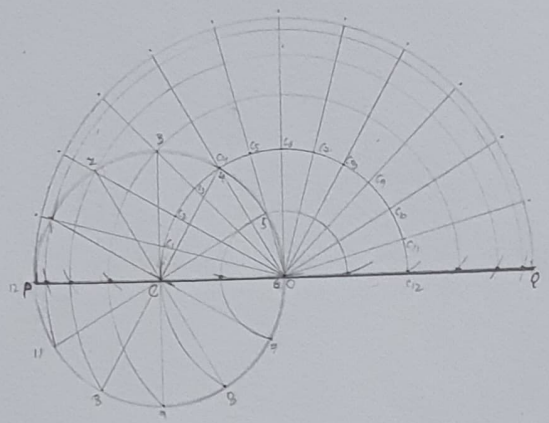
$PQ = RS = \frac{2\pi r}{2} = \pi \times 50 \text{ mm} = 78.5 \text{ mm}$



Q10) Show by means of a drawing that when the diameter of the directing circle is twice that of generating circle, the hypocycloid is a straight line. Take diameter of generating circle equal to 50mm.

$r = 25$ mm
$R = 50$ mm

$$\theta = \frac{r}{R} \times 360^\circ = \frac{25}{50} \times 360^\circ = 180^\circ$$



MUKUND KUKREJA AIML-I

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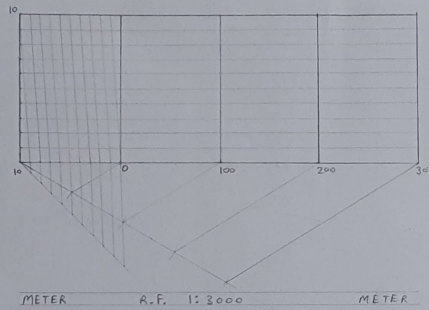

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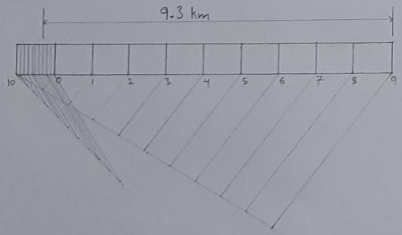

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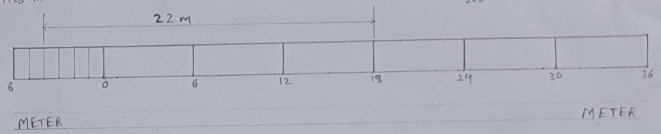
42 m = 7 p x 6 m

6 m = 6 p x 1 m



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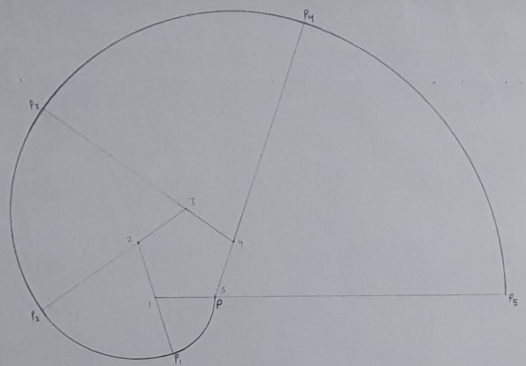

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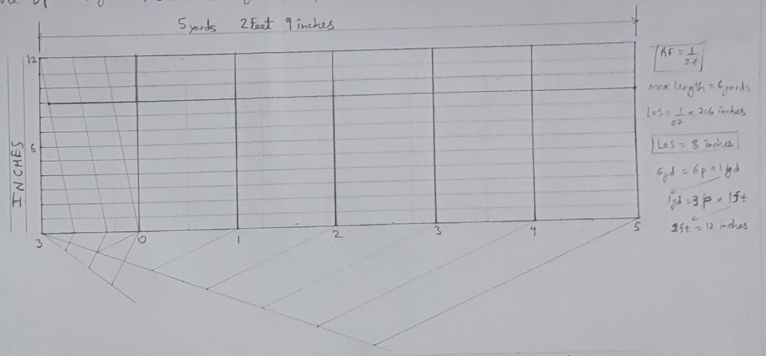

R.F. = 1/27
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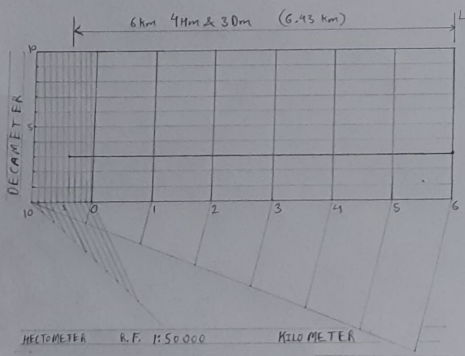

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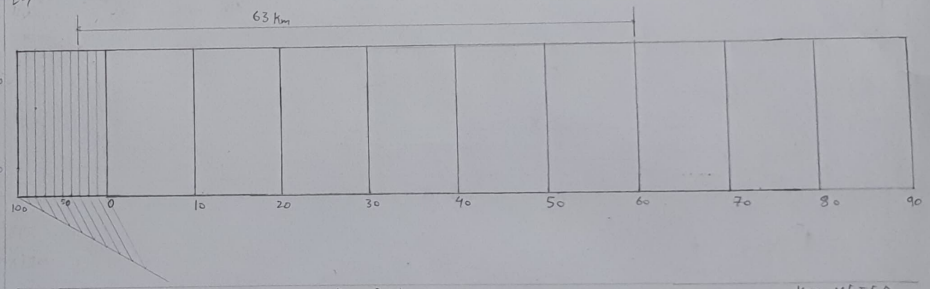

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Max length = 100 km

LOS = 3/1000000 × 100 × 100000 cm = 30 cm

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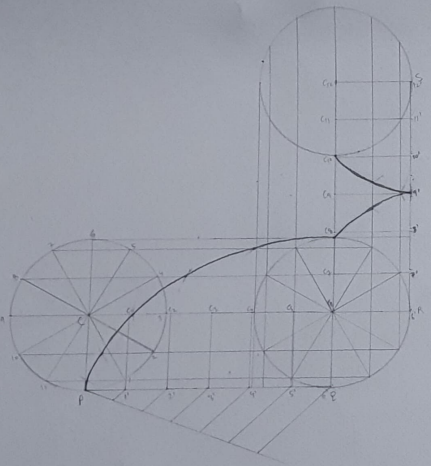

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