**Problem 1**

P3

11-P

P11

P10

10-P

5-P

9-P

8-P

P7

7-P

P8

P5

4-P

P4

2-P

P2

P1

1-P

P

12

**A**

11

10

9

1

2

4

5

6

7

8

3

11

9

7

12

10

8

6

5

4

3

2

1

πD ≈ 157 mm

P6

6-P

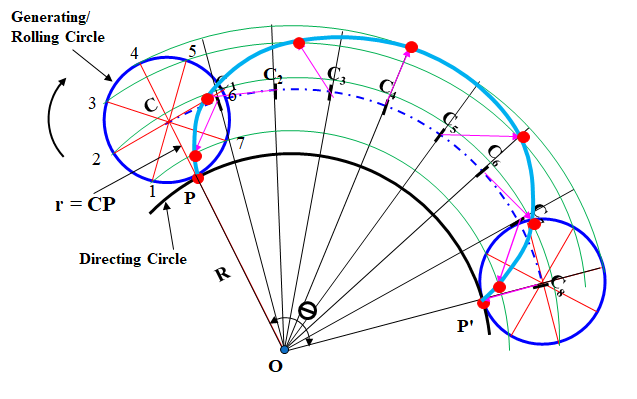
P9

3-P

C

**Problem 2**

**USE SUITABLE SCALE**

****

**ϴ = r/R x 360º**

**= 0.25/1.5 x 360º**

**= 60º**

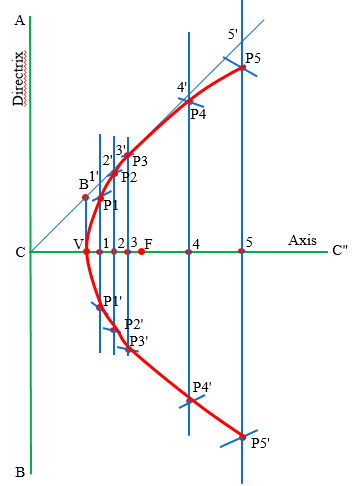
**R = 1.5 m**

**= 0.25 m**

**Problem 3**

**60 mm**

**Normal**

****

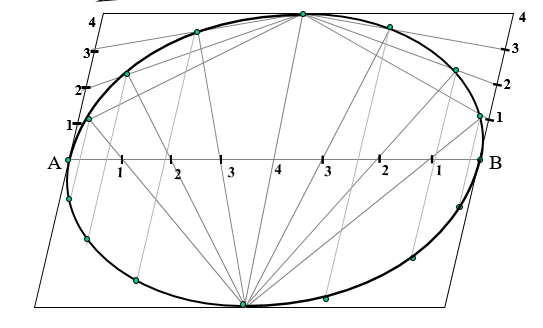
**Tangent**

**25 mm**

**50 mm**

**Problem 4**

**120 mm**



**50º**

**80 mm**