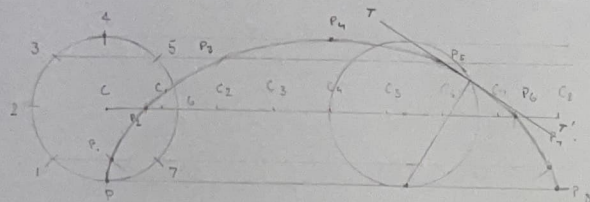
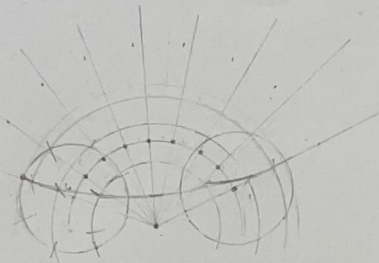


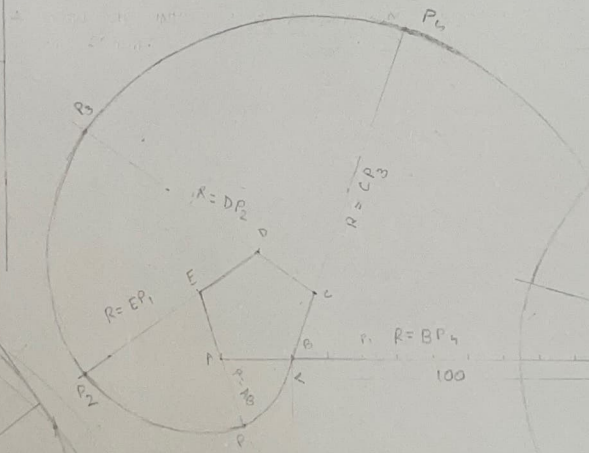
1. A CIRCLE OF 20mm DIAMETER ROLLS ALONG A STRAIGHT LINE WITHOUT SLIPPING. DRAW THE CURVE TRACED OUT BY A PT. P ON THE CIRCUMFERENCE, FOR ONE COMPLETE REVOLUTION OF THE CIRCLE. DRAW A TANGENT TO THE CURVE AT A POINT ON IT 35 mm FROM THE DIRECTING LINE.



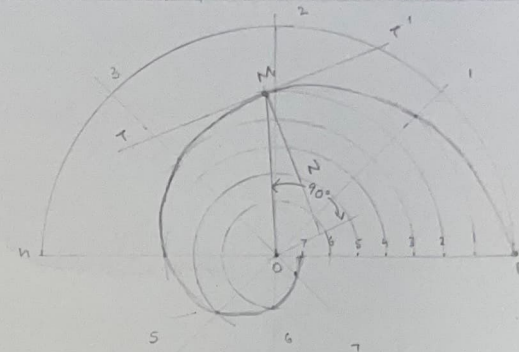
3. DRAW A HYPOCYCLOID, ROLLING CIRCLE 30mm DIAMETER AND DIRECTING CIRCLE 180mm DIAMETER. DRAW A TANGENT AND NORMAL TO IT AT A PT. 20mm FROM THE CENTER OF DIRECTING CIRCLE.



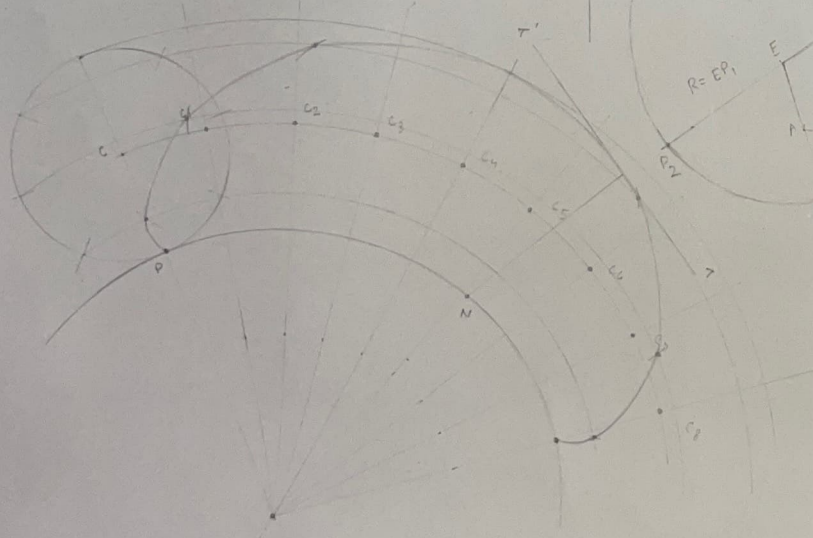
4. DRAW THE INVOLUTE OF A PENTAGON HAVING EACH SIDE 20mm.



6. A PT. P IS 65mm AWAY FROM THE FIXED PT. POLEO. PT. P MOVES TOWARDS O & REACHES THE POSITION P' IN ONE CONV. WHERE OP' IS 11mm. PT. P MOVES TOWARDS E, AROUND 'O' UNIFORMLY.



2. DRAW AN EPICYCLOID WITH ROLLING CIRCLE DIAMETER 60mm AND DIRECTING CIRCLE DIAMETER 160mm. DRAW TANGENT AND NORMAL AT A POINT ON THE CURVE 120mm FROM THE CENTER OF THE DIRECTING CIRCLE.



5. DRAW AN INVOLUTE OF A CIRCLE 40mm DIAMETER.

