1- RELATIONSHIPS BETWEEN LINES AND CIRCLES

1— EXTERNAL LINE

2— SECANT

3 — TANGENT

90°
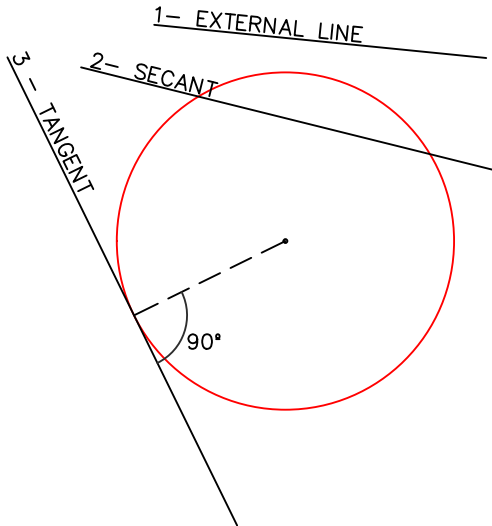
1- The line doesn't touch the circle
2- The line crosses the circle at 2 points
3- The line touches the circle at <u>ONE POINT</u>

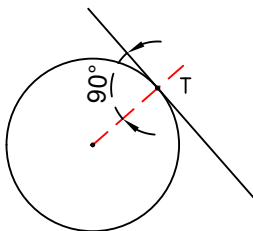## 2- THE SEGMENTS OF A CIRCLE

CHORD

RADIUS

DIAMETER
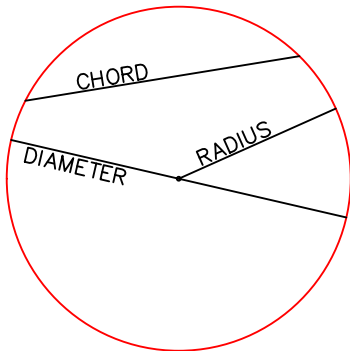
3- PRINCIPLES ABOUT TANGENTS

The exercises about tangents are based on some easy principles.

1. If one line is tangential to a circle, the contact point is at the perpendicular line drawn from the circle's centre.

90°   T

2. If one circle is tangential to another circle, the contact point , "T" , is at the line that links the centres.

T
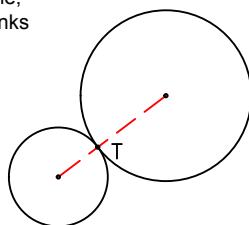
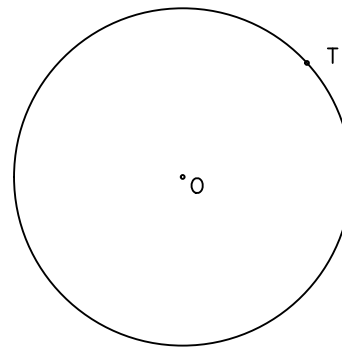## 3. The perpendicular bisector of any chord of a circle passes through the circle's centre
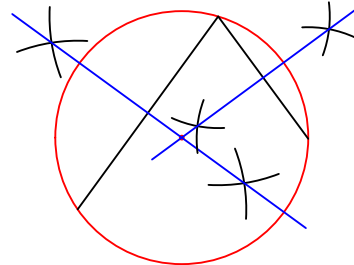
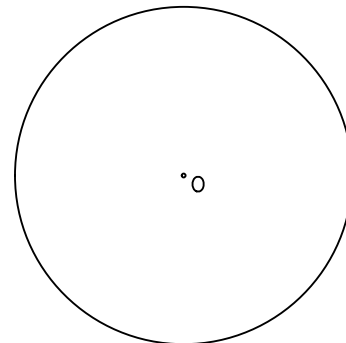## 4- CONSTRUCTIONS

4.1 - TANGENT AT A POINT ON A CIRCLE
http://www.mathopenref.com/consttangent.html

THE PRINCIPLE USED TO SOLVE IS   1   2   3

T

°O

4.1 - TANGENTS TROUHG AN EXTERNAL POINT "P"
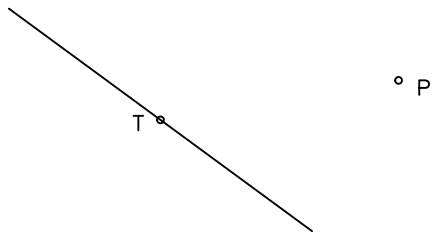http://www.mathopenref.com/consttangents.html

THE PRINCIPLE USED TO SOLVE IS   1   2   3

°O

∘ P

4.3 - CIRCLE THAT PASSES TROUGH A POINT "P" AHD THAT IS TANGENTIAL TO A LINE AT A POINT "T"
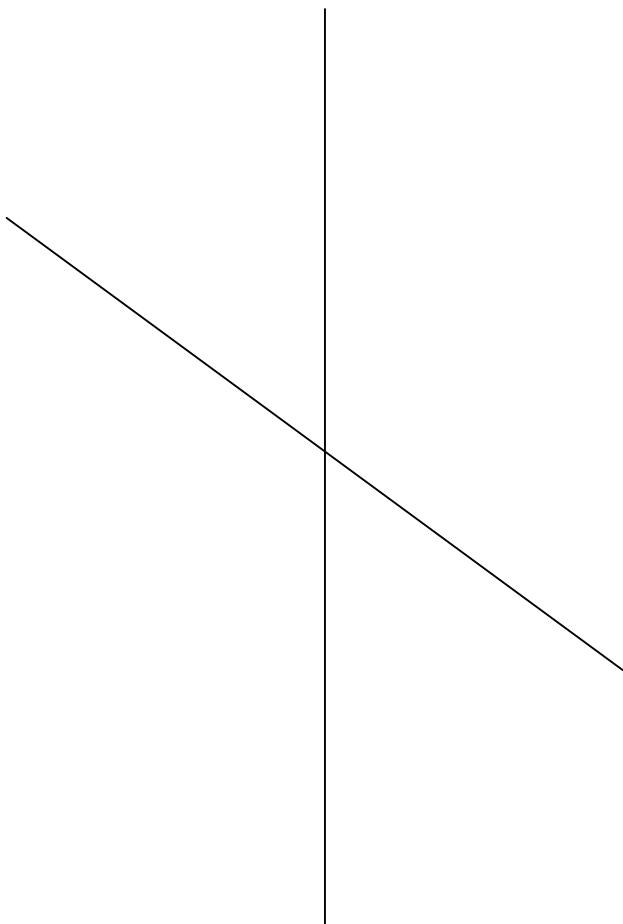
THE PRINCIPLE USED TO SOLVE IS   1   2   3

T °   ° P

4.4 - TANGENT CIRCLES TO TWO LINES WHEN IT'S KNOWN THE CIRCLE'S RADIUS
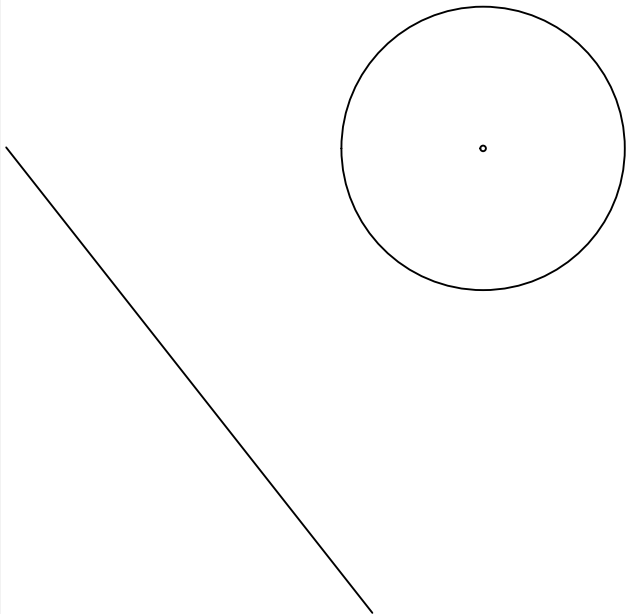
THE PRINCIPLE USED TO SOLVE IS   1   2   3
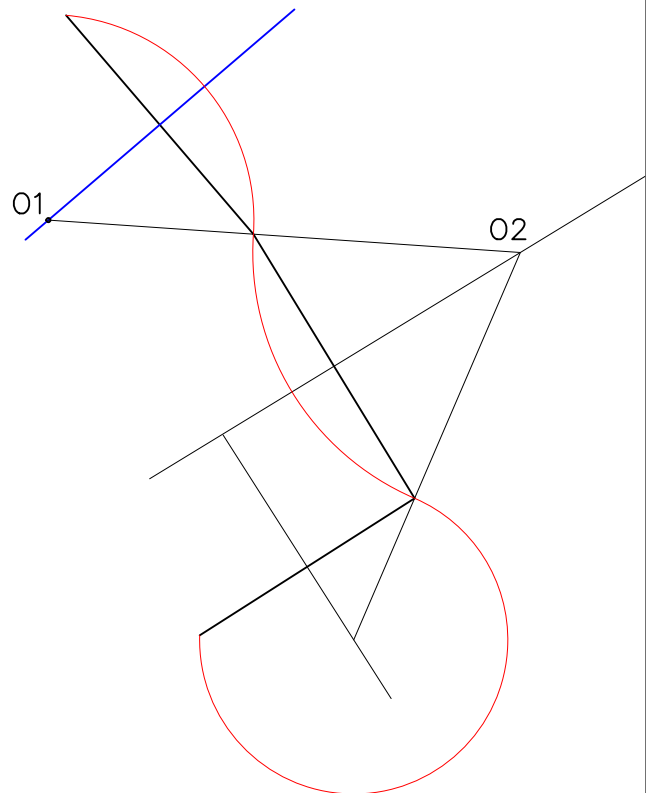
⌞ Radius ⌟

4.5 - TANGENT CIRCLE TO ONE LINE AND ANOTHER CIRCLE WHEN IT'S KNOWN THE CIRCLE'S RADIUS

THE PRINCIPLE USED TO SOLVE IS   1   2   3

4.6 - CURVE THAT ENVELOPS A POLYGONAL LINE

THE PRINCIPLE USED TO SOLVE IS   1   2   3

O1   O2

ACTIVITY 1/3. APPLICATION OF TANGENTS IN DESIGN

TO DO THIS EXERCISE, YOU NEED TO FIND THE   CENTRES OF
EACH CURVE. HOW?
1— EACH CENTRE MUST BE IN THE PERPENDICULAR BISECTOR
OF EACH SEGMENT
2— EACH CENTRE MUST BE IN THE LINE   JOINING THE LAST
CENTRE AND THE TANGENTIAL POINT OF BOTH ARCS.
Once you have finished, you must do a graphic treatment in
the piece of TRACING PAPER.

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