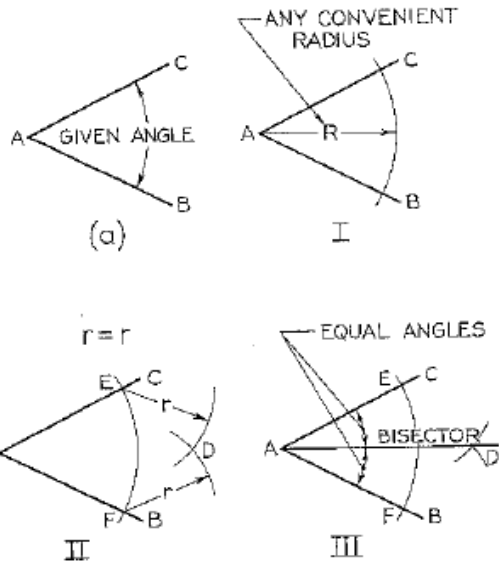
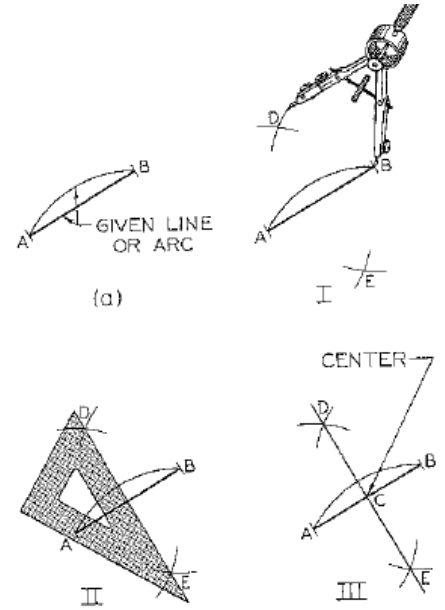


Geometric Constructions/ Descriptive Geometry

Bisecting a Line

- (a) You are given the line with the length AB and need to bisect it.
- (I) From each end point of the line, strike equal arcs with radius slightly larger than half of AB to intersect at points which you will label D & E.
 - (II) Draw a line from points D & E
 - (III) Line DE will intersect the original line at center C, (the half way point of the line).

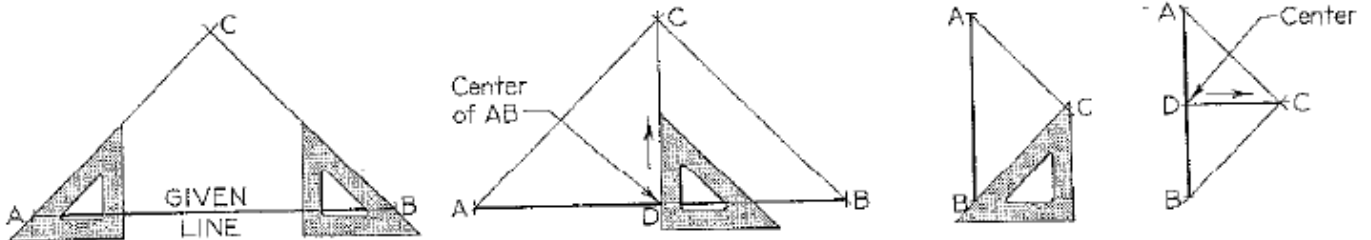


Bisecting an Angle

- (a) You are given the angle BAC and need to bisect it.
- (I) From the Vertex of angle BAC, strike a large arc R
 - (II) From the large arc R you just drew, you know have points E & F. From points E & F, strike arcs "r" with radius slightly larger than half of BC, to intersect at D.
 - (III) Draw a line from A to D, which bisects the angle

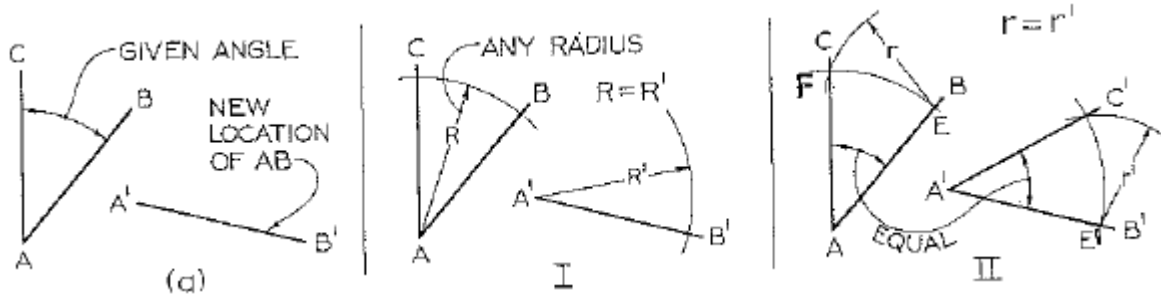
Bisecting a Line with a Triangle

- You are given line AB. From each of the endpoints draw a 45° lines up so they meet at point C.
- From Point C draw a line vertical down, creating point D, which is the center of AB.
- This can be done with horizontal or vertical lines.



Transferring an Angle

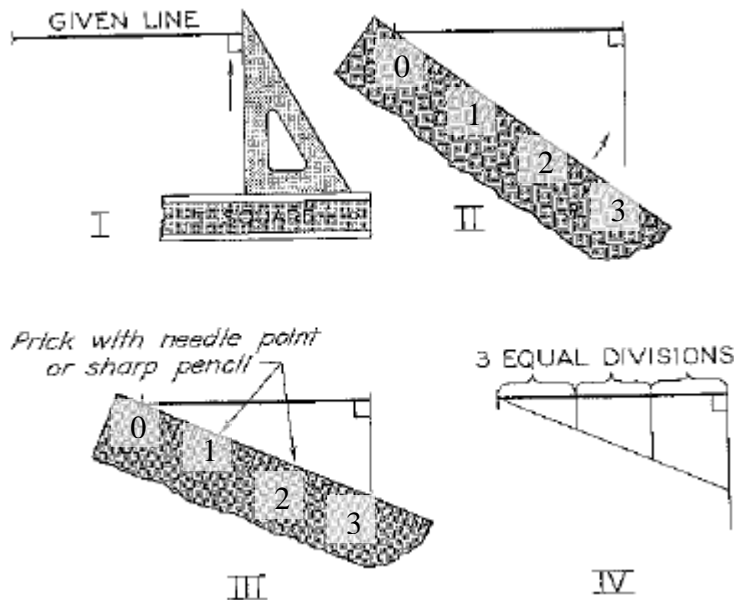
- (a) You are given angle BAC, and need to transfer it (or rotate it) to the new position of at A'B'.
- (I) Use any convenient radius R, and strike arcs from the centers A and A'.
 - (II) Where radius R intersects line AB, label point E.
 *Where radius R intersects line AC, label point F.
 * Put your compass on point E and open it so it hits point F. This is radius "r".
 * Put your compass on point E' and strike arc r. Where it intersects the previously drawn R radius, draw a line from that intersection back to point A'.
 * Your angle is now transferred.



Divide a Line into Equal Parts

- (I) You are given a line that needs to be divided into equal parts.
 * Draw a perpendicular line down from one end of the given line.
- (II) Place a scale of convenient size, and set the zero at the first end point of the given line.
- (III) Swing the scale up until the number you want to divide the parts into hit the vertical line you drew.
- (IV) Mark the points along the scale you want to divide it, and then draw perpendicular lines up from those points to the given line.
 * Your line will now be equally divided.

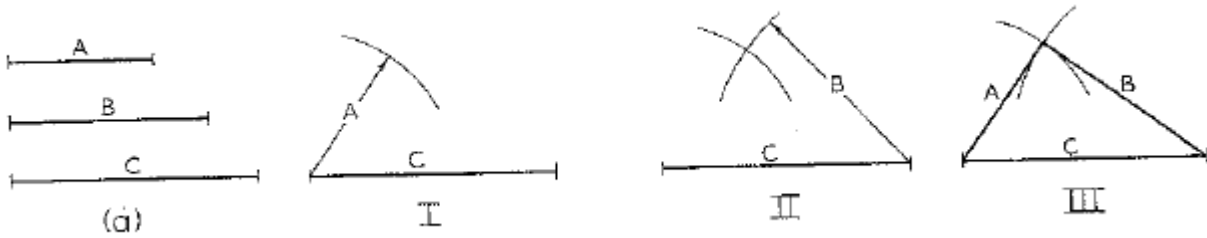
(This same idea can be applied if you want to divide a line proportionally)



Drawing a Triangle with Sides Given

(a) You are given 3 line segments, line A, B, and C.

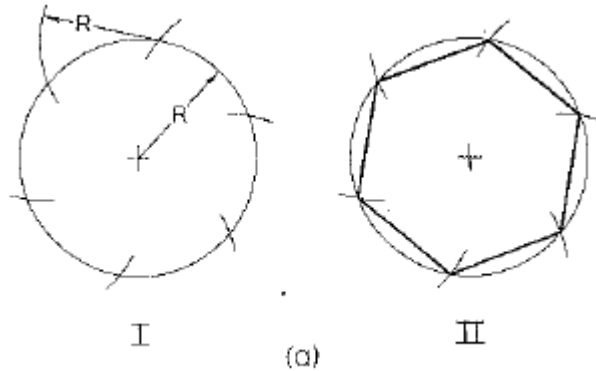
- (I) Draw one side, such as C, in the desired position, and strike arc with radius equal to side A.
- (II) On the other side of the line, strike an arc with radius equal to side B.
- (III) Where those two arcs intersect, draw sides A and B as shown.



Drawing a Hexagon

Each side of the hexagon is equal to the radius of inside (circumscribed) circle.

- (I) Using a compass set at the radius of the circle, set off the 6 sides of the hexagon around the circle.
- (II) Connect the points with straight lines.

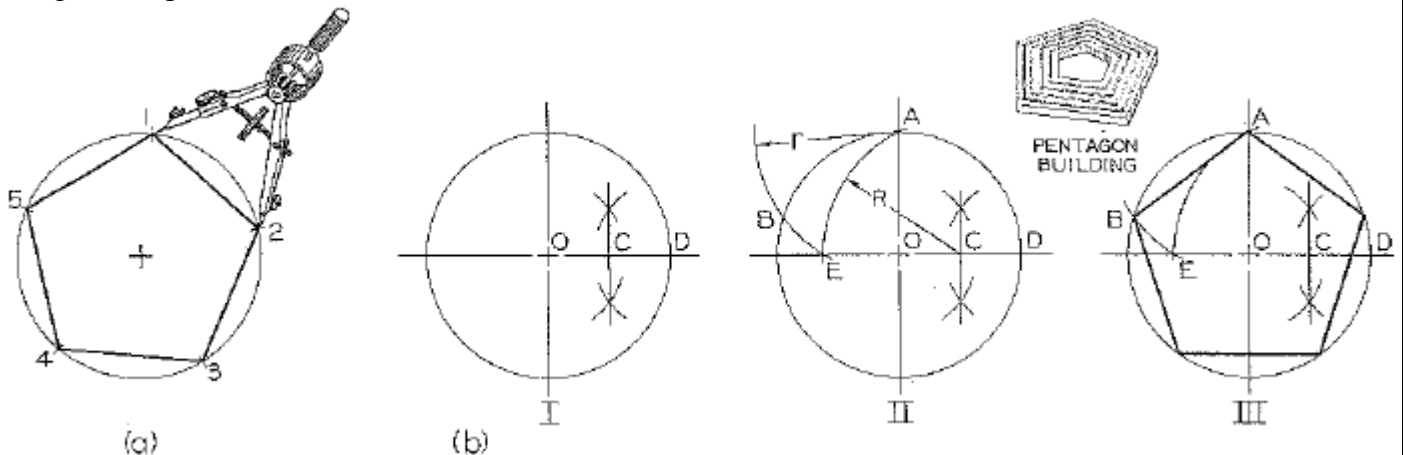


Drawing a Regular Pentagon

(a) You are given a circle; divide it to draw a pentagon.

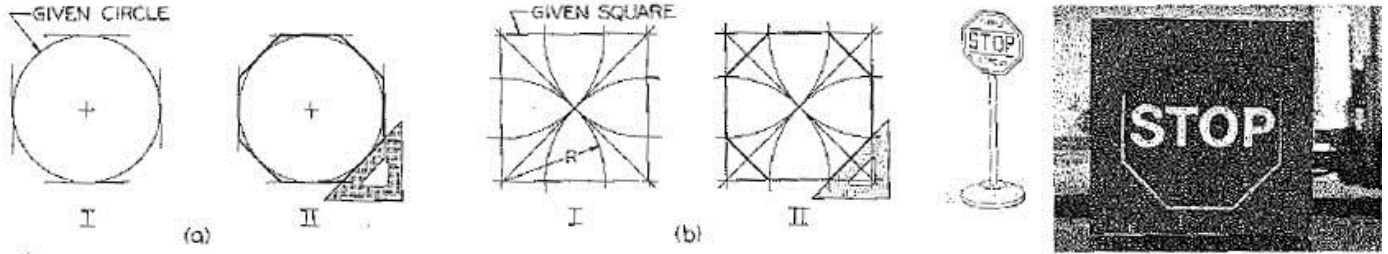
- (I) Bisect radius OD at C.
- (II) With C as center and CA as radius, strike arc AE.
* With A as center and AE as radius, strike arc EB.

(III) Draw line AB; then set off distances AB around the circumference of the circle, and draw the sides through these points.



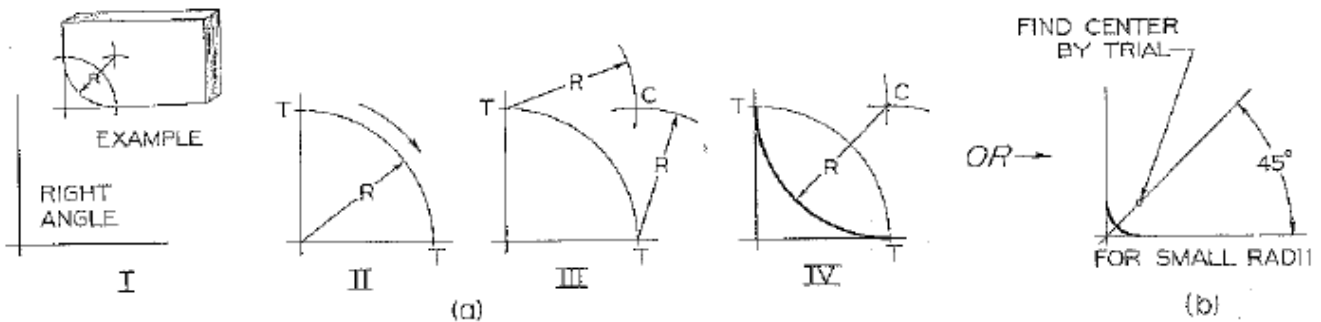
Drawing an Octagon

- (I) Given an inscribed circle, use a straightedge and a 45° triangle to draw the eight sides tangent to the circle, as shown.
- (II) Given the square, draw diagonals across the square from corner to corner. Then take a compass and draw arcs with half the diagonals as the radius, cutting the sides as shown. Use as a straightedge and 45° triangles to draw the 8 sides.



Drawing a Tangent Arc in a Right Angle

- (I) Two Lines are given at right angles to each other
- (II) With given radius R , strike arc intersecting given lines at tangent points T .
- (III) With given radius R again, and with points T as centers, strike arcs intersecting at C .
- (IV) With C as center and given radius R , draw the required tangent arc.



Drawing an Arc Tangent to Two Lines at acute or Obtuse Angles

Follow along with the sketches to draw the arcs.

