

CHAPTER IV.

Bisection of Lines and Angles. Perpendiculars.

1. To bisect a straight line.

Suppose AB the line to be bisected. With A and B as centres describe portions of circles with equal radii intersecting at C , and with the same centres describe portions of circles with equal radii, intersecting at D . Then if CD be drawn, it bisects AB at right angles.

For, using the dividers, it will be found that AE and EB are equal; and, using the protractor or set-square, all the angles at E will be found to be 90° .

Or again, we would conclude that AE and EB are equal, and that the angles at E are right angles, from the **symmetry** of the figure with respect to the line CD —the figure on one side of this line being just the same as the figure on the other side, but turned in the opposite direction.

Or again, we may “reason out” the equality of AE and EB , and that the angles at E are right angles, as follows: Since the triangles ACD , BCD have their sides equal, they are equal in all respects (Ch. III., 1). Hence the angles at C are equal; also the sides about these angles, AC , CE , and BC , CE , are equal; therefore (Ch. III., 2) the triangles ACE and BCE are equal in all respects. Hence AE is equal to BE ; also the angle AEC is equal to the angle BEC ; therefore each is 90° .

