CIRCLES

Page 1: Construct three concentric circles.

Page 2: Construct two concentric circles. No matter how you drag them, the radius of the larger circle should always be twice the radius of the smaller circle.

Page 3: Construct a circle and its radius. Animate the radius so that it spins around the circle. The radius should not change its length as it spins. Construct two or more points on the radius. Trace the path of these points as the radius spins.

Page 4: Construct a circle. Label the two points that define the circle as *A* and *B*. Construct radius *AB*. Measure the length of *AB*. Use the Calculate tool to compute the circumference and area of the circle. When you drag point *A* or *B* (or animate them), your calculations should update to display the new circumference and area.

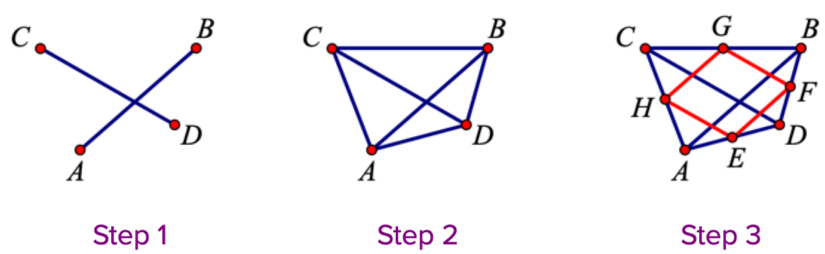
Page 5: Construct a diameter of a circle that can spin around the circle. The diameter should not change its length as it spins.

Page 6: Construct an isosceles triangle. When you are done, hide everything in your sketch other than the triangle.

Page 7: Construct an equilateral triangle. When you are done, hide everything in your sketch other than the triangle.

Page 8: Construct three circles whose radius is equal to *AB*. Then, construct three circles whose radius is half the length of *AB*. Construct a circle whose radius is one-quarter the length of *AB*.

Page 9: The pictures below show a step-by-step construction. I began in Step 1 by constructing two intersecting segments, *AB* and *CD,* that are always equal in length. In step 2, I constructed quadrilateral *ABCD*. I concluded in Step 3 by constructing the midpoints of the four sides of *ABCD* and connecting them to form quadrilateral *EFGH*. Build this construction yourself and prove that no matter how you drag points *A, B, C,* and *D,* quadrilateral *EFGH* is always a rhombus.



Page 10: Construct a triangle *ABC* such that no matter how you drag its vertices, side *AB* is always twice the length of side *AC*.

Page 11: This sketch shows three segments—*a, b,* and *c*—in the lower-left corner of the sketch. There is a triangle in the sketch, and its side lengths are always equal to *a, b,* and *c*. Drag the endpoints of the three segments in the lower-left corner to confirm that the sides of the triangle remain equal to these segments as you change their lengths. Move on now to page 12, where the fun begins!

Page 12: Here, you'll see the beginnings of the sketch from page 11. Use the segments in the lower-left corner to build the triangle you see on page 11. How might you use this sketch (along with the Calculate tool) to demonstrate the triangle inequality theorem?

QUADRILATERALS

Pages 1 and 2: Construct a parallelogram.

Page 3: Construct a rectangle.

Page 4-6: Construct a square. On page 6, some of the square has already been built.

Page 7: Construct a *constant-perimeter rectangle*. That is, construct a rectangle whose length and width measurements can change, but whose perimeter always remains 24 cm. Animate the rectangle so that it shows the full range of rectangles with this perimeter.

Page 8-10: Construct a rhombus.

Page 11-13: Construct kites. On page 13, two adjacent sides of the kite have already been constructed.

For each construction above, the quadrilateral you construct should pass the "drag test." To check, for example, whether your parallelogram really is a parallelogram, drag each of its vertices to see if it changes size, shape, and orientation, but always remains a parallelogram.