

Congruence Worksheet 2 - Answers

1. Given a line segment \overline{AB} , what is the first step in constructing an equilateral triangle $\triangle ABC$?
Using a compass, mark the length of the segment \overline{AB} . Using A as the center, draw an arc above the line segment.
square?
Using the compass, measure the length of the sides. Draw an arc of this length from both the endpoints (not the vertex of the perpendicular angle) of the segments. The two arcs should intersect. With a straightedge, connect this point to the two endpoints of the segments.
2. What would be the next step in constructing the equilateral triangle $\triangle ABC$?
Without altering the compass measurement, draw an arc above the line segment using point B as the center. The two arcs should intersect one another at point C .
3. What is the final step of constructing the equilateral triangle $\triangle ABC$?
Using a straightedge, draw line segments \overline{AC} and \overline{BC} .
4. How would you construct an equilateral triangle inscribed in a circle?
Draw a circle with a diameter. Adjust the compass so that its length is equal to the length of the radius. Using one of the diameter's points on the circle as the center, draw a semicircle such that two intersections are formed. With a straightedge, draw line segments that connect the two intersection and the opposite endpoint of the diameter. These three segments make an equilateral triangle.
5. Given two perpendicular and congruent sides, how would you construct a square?
Construct a segment perpendicular to the given segment at one of the given endpoints. Using a compass, mark the length of the newly drawn segment at the same length as the given segment. Complete the construction using the answer to question 5.
6. Given only a line segment, how would you construct a square?
Construct a circle and draw its diameter with a straightedge. Construct a segment perpendicular to the diameter at the center of the circle. These two segments should cross the circle at four points. With a straightedge, connect these four points.
7. How would you construct a square inscribed in a circle?
Construct a circle and draw its diameter with a straightedge. Construct a segment perpendicular to the diameter at the center of the circle. These two segments should cross the circle at four points. With a straightedge, connect these four points.
8. How would you construct a square given a line segment that must be the diagonal of the square?
First, construct the perpendicular bisector of the given segment. Using a compass, mark the distance from the midpoint to one of the endpoints and draw a complete circle. This circle should intersect the given line segment

and its perpendicular bisector at four points. Connect these four points with a straightedge.

9. How would you construct a regular hexagon inscribed within a circle?

Using a compass, mark the distance of the radius of the circle. Choosing an arbitrary point on the circle as a starting place, draw a small arc that intersects with the circle keeping the compass at the same length. Use this new intersection as the new point, repeat this process until six you have six intersections between the circle and these arcs.

These will be the six vertices of the hexagon. Connect these vertices with a straightedge.

10. How would you construct a regular hexagon given one of the side lengths?

With a compass, mark the distance of the segment. Draw two small intersecting arcs above the segment using the two endpoints as vertices. The intersection of these two arcs will form the center of the circle with a radius that is the same length as the given side. Draw this circle and continue using the answer to question 9.