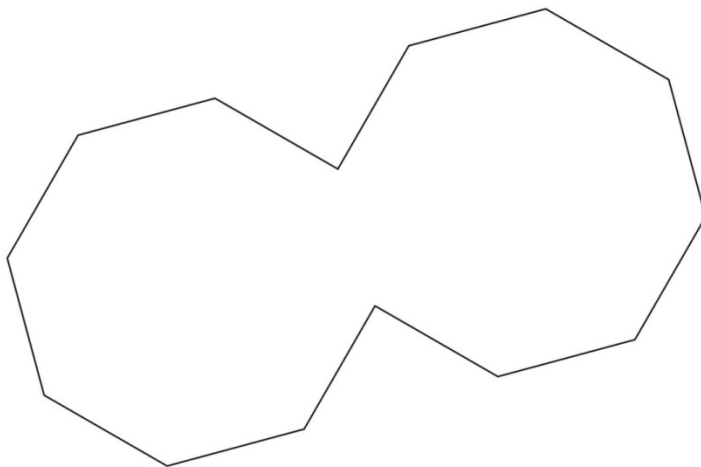# Geometry Homework #17

1) Convert $\dfrac{11\pi}{12}$ radians into degrees.

2) Determine which types of symmetries the following figure contains and then draw all lines of symmetry and all points of symmetry on the figure:


3) Perform the following transformation to determine the final location of each point (Show ALL work!): Translate 2 units down and 1 unit to the left, vertical reflection over the line x = –2 axis, horizontal reflection over the x axis, and a size transformation of 2 times larger for the points $(-3,1),(2,3),$ and $(-1,-2)$.

4) Perform the following transformation to determine the final location of each point (Show ALL work!): Translate 5 units to the right, horizontal reflection over the line y = 3, and a clockwise rotation of 170 degrees about the point $(4,2)$ for the point $(-2,1)$.

5) Solve $\sin\dfrac{11\pi}{6} = \dfrac{4x}{9}$

6) If $\angle A \cong \angle E,\ \overline{CB} \cong \overline{FD},$ and $\angle B \cong \angle D$, are triangles ABC and EDF congruent? If they are congruent, explain why, and if they are not congruent, explain why and draw a counterexample.

7) In the following figure, $\overline{AB}\, P\, \overline{CD}$ and $\overline{AB} \cong \overline{CD}$. Are any of the triangles formed congruent and, if so, name them and explain why?
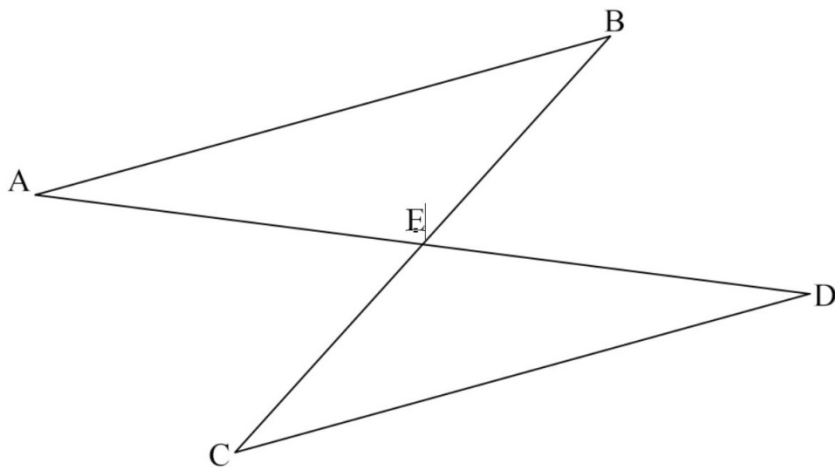
8) If quadrilateral ABCD is a square and E is a point on segment BA and F is a point on segment AD such that segments CE and BF are perpendicular and intersect each other at point G. Prove that triangle CBE is congruent to triangle BAF.

9) If BD is both an altitude and a median of triangle ABC and BD intersects segment AC at D, are triangles ADB and CDB congruent? If they are congruent, explain why, and if they are not congruent, explain why and draw a counterexample.

10) If both segments AB and CD are diameters of circle G and intersect at the center of the circle, G, prove that triangles CGA and DGB congruent.

11) In the following figure, angle A is congruent to angle B and segment AC is congruent to segment BC. Are triangles ACD and BCD congruent? If they are congruent, explain why, and if they are not congruent, explain why and draw a counterexample.
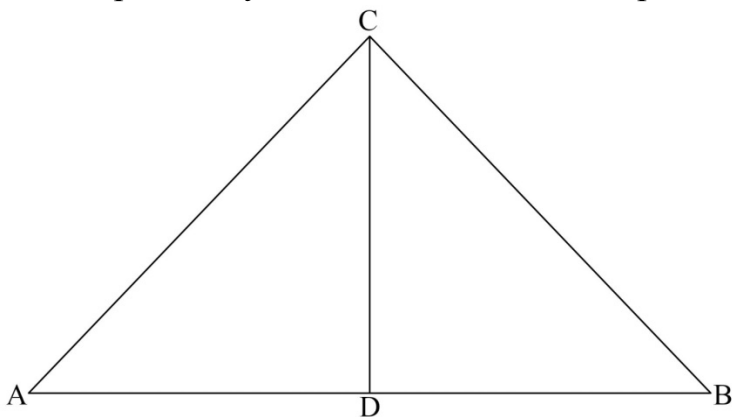

12) If quadrilateral ABCD is a parallelogram with diagonal BD, prove that triangles ABD and CDB are congruent.

13) If ABCD is a quadrilateral with diagonal AC, and $\overline{AD} \cong \overline{AB}$ and $\overline{CD} \cong \overline{CB}$ are triangles ABC and ADC congruent? If they are congruent, explain why, and if they are not congruent, explain why and draw a counter example.

14) In the following figure, angles ECD and EAB are congruent. If angles CDE and EBA are also congruent, are any of the triangles formed congruent? If they are congruent, explain why, and if they are not congruent, explain why and draw a counter example.
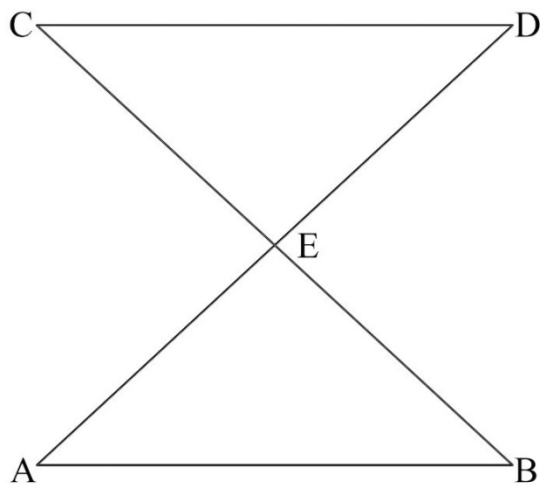

15) If quadrilateral ABCD is a rectangle with diagonal AC, prove that triangles ABC and CDA are congruent.

16) In the following figure, segment BD is an angle bisector of angle ABC and angle C is congruent to angle A. Prove that triangles ABD and CBD are congruent.
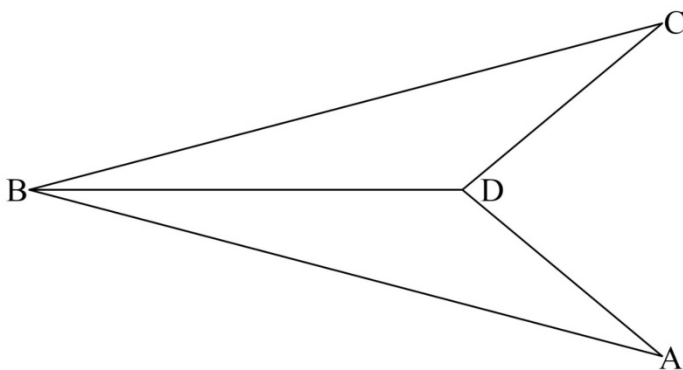
17) If $\angle A \cong \angle D$, $\overline{AB} \cong \overline{DE}$, and $\angle B \cong \angle E$, are triangles ABC and DEF congruent? If they are congruent, explain why, and if they are not congruent, explain why and draw a counterexample.

18) In the following figure, $\overline{BD} \perp \overline{AC}$ and $\overline{BE} \cong \overline{ED}$. Are any of the triangles formed congruent and, if so, name them and explain why?
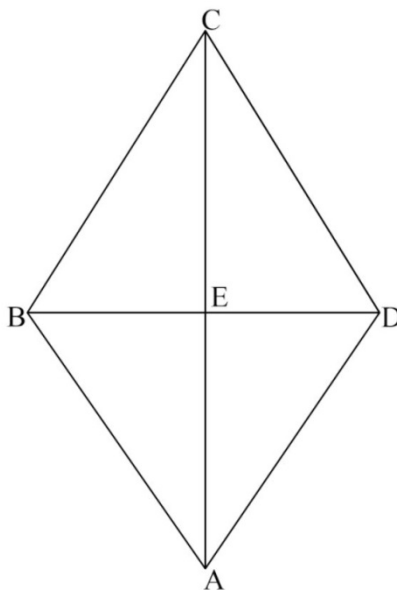
19) If quadrilateral EFGH is a parallelogram with diagonal FG, are triangles EFH and HGF congruent? If they are, prove it. If not, explain why not.

20) In the following figure, E is the midpoint of segment AD and segment AB is congruent to segment DC. Are triangles ABE and DCE congruent? If they are congruent, explain why, and if they are not congruent, explain why and draw a counterexample.