Recall – properties of quadrilaterals, isosceles triangles; finding the area of a triangle; trigonometry.

1. The diagonals d_1 and d_2 intersecting at point E were drawn on the rhombus ABCD at right. d_1= 8 and d_2= 14.
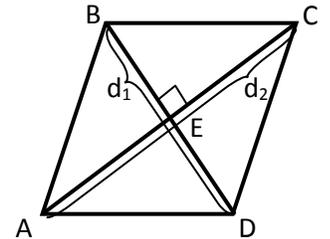
    a) What do the diagonals do to each other in a parallelogram? _____

    b) What is the relationship of the diagonals of a rhombus? _____

    c) Are the four little triangles congruent? _____ Why? _____

    d) Are triangles ABC and CDA congruent? _____ Why? _____

   e) Find the area of ΔABC in terms of d_1 and d_2 using area = bh/2.

    f) Find the area of ΔCDA in terms of d_1 and d_2 using area = bh/2.

    g) Find the area of the rhombus ABCD as a composite figure in terms of d_1 and d_2 by adding the areas of ΔABC and ΔCDA. Reduce your fraction to generate the formula for the area of a rhombus in terms of the diagonals.

    h) Can you put your general formula into words? The area of a rhombus is equal to ….

2. Given the isosceles triangle with a vertex angle of 45° and base of 10 inches,
    a. Draw in the altitude from the vertex angle. Describe how you knew where the altitude would be and any resulting relationships from it.
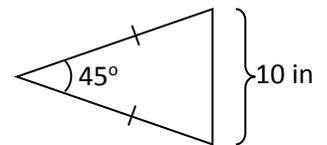
    b. Determine the actual length of the altitude (that is, the height of the triangle), to the nearest tenth:

3. A **polygon** is a simple, closed, plane figure formed by three or more segments such that each segment intersects exactly two other segments only at their endpoints and no two segments with a common endpoint are collinear. Note: the number of sides = the number of vertices. CROSS off any of the following that are not polygons:
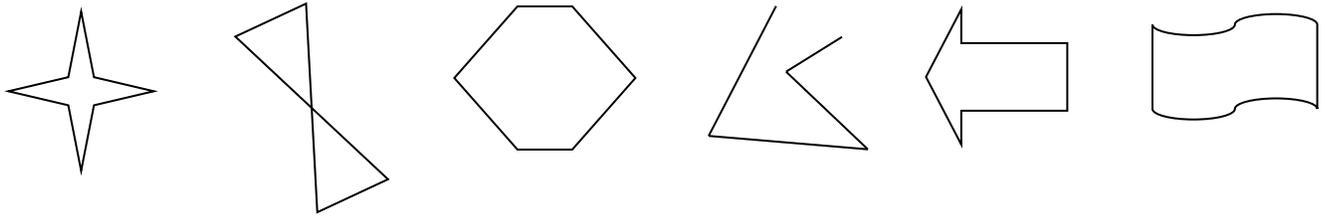
4. A polygon can be **convex or concave**. In a convex polygon, all diagonals from any vertex to another are completely contained within/on the polygon. CROSS off any of the following polygons that are not convex:
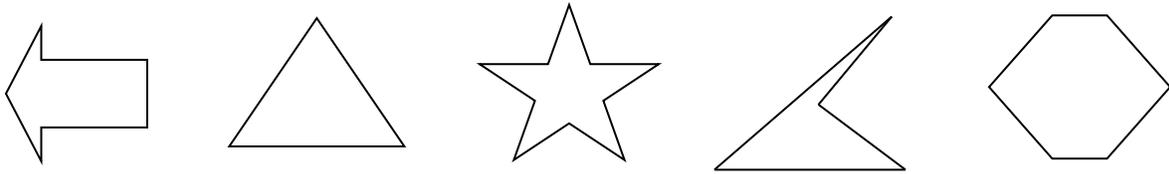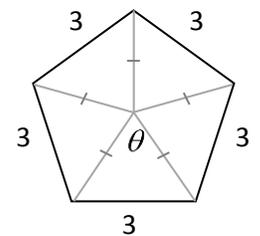
5. A **regular** polygon in one in which all the sides and angles are congruent. CROSS OFF any of the following who are not regular polygons:
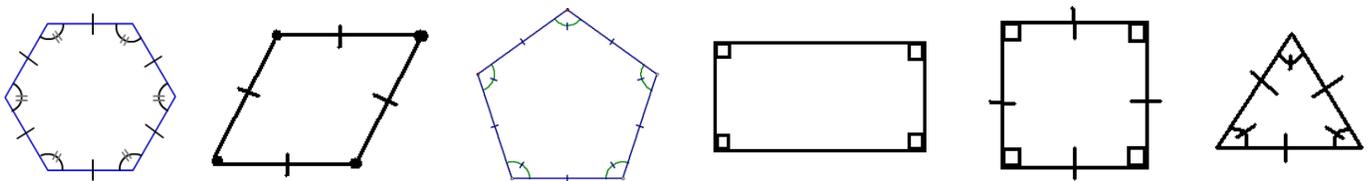
6. The pentagon pictured is a regular pentagon.

    a. The little triangles with a vertex at the center of the pentagon could be classified by sides as _____. Would they all be congruent? _____

    If so, why? _____

    b. What do you think would be the measure of θ? _____ Why? _____
        *Note: this is called the **central angle** of the polygon.*