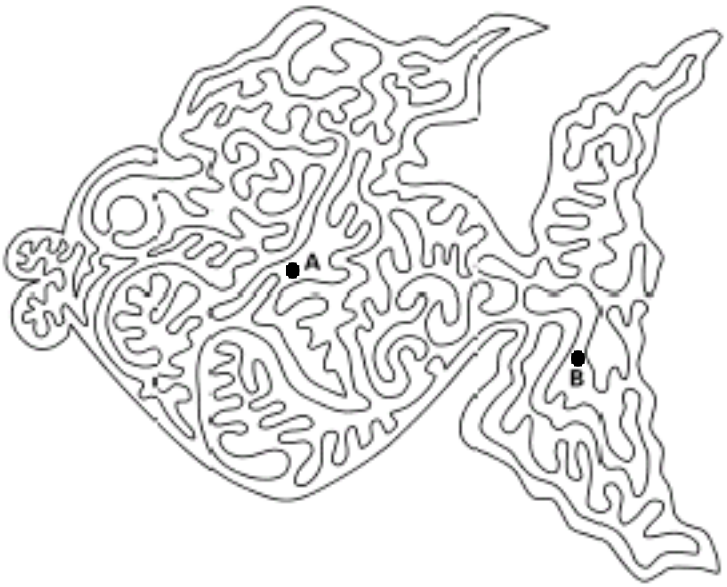
MTH 104 Test 3
Spring 2007

Mathematics for Elementary School Teachers II

Name _____

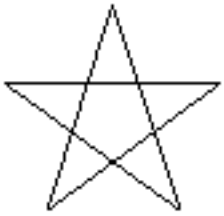
Circle all answers

1. Classify the points **A** and **B** in the figure to the right as either interior or exterior points **and** explain your answers.



2. There are five(5) regular polyhedra. What conditions must be met for a polyhedron to be classified as "regular"?

3. The following star has a regular pentagon at its center and isosceles triangles drawn on each side. Determine the measure of one of the angles at the tip of the star.



4. The *truncated icosahedron* or *Buckyball* is a convex polyhedron with 12 pentagonal faces, 60 vertices and 90 edges. How many hexagonal faces are situated on this polyhedron?

5. Invoking the procedure below will cause the Logo turtle to draw a regular heptagon if the correct angle value is given for the ? , What should that value be (in degrees) ?

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to heptagon
 repeat 7[ fd 40 rt  ?]
end
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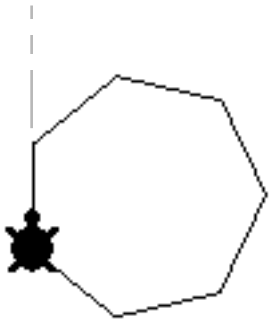


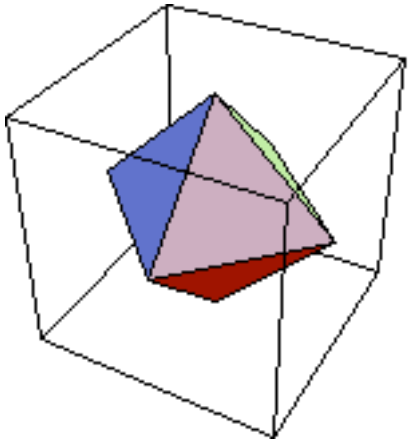
6. Twice the measure of $\angle R$ is one-half the measure of $\angle S$. If $\angle R$ and $\angle S$ are complementary angles. what is the measure of $\angle R$?

7. **a)** How many degrees does the earth turn in 1 hour?

b) How many degrees does the earth turn in one minute?

c) Find the measure of the angle formed by the minute and hour hands of a clock at 4:30.

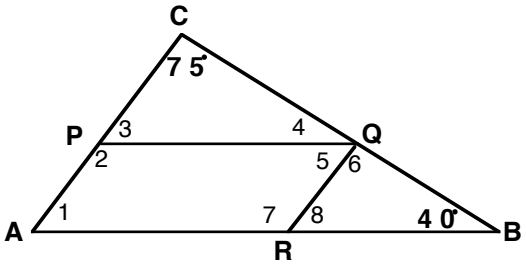
8. The centers of the faces of a cube can be connected to form a regular octahedron. Also, the centers of the faces of an octahedron can be connected to form a cube. Such pairs of polyhedra are called *duals*.



a) Find two other regular polyhedra that are duals of each other.

b) What regular polyhedra is its own dual?

9. Let $\overline{PQ} \parallel \overline{AB}$ and $\overline{RQ} \parallel \overline{AC}$. Find the measures of angles 1 through 8 below.



10. A *diagonal* of a polygon is a segment which joins two nonadjacent vertices of that polygon. As shown below, a triangle has no diagonals, a quadrilateral has 2, a pentagon has 5, a hexagon has 9, and a heptagon has 14 diagonals. How many diagonals has a dodecagon?