MA 202-01 §10.1 – 10.5	**Test #2**	*score*	**Name:** _____ **29 June 2001**

1. Using only a compass and straight edge, construct each of the following. In some cases you may need to add written instructions to explain the steps used in the construction if they are not clear from your drawing. *(4 points each)*

   (a) An equilateral triangle.

   (b) A 75° angle.

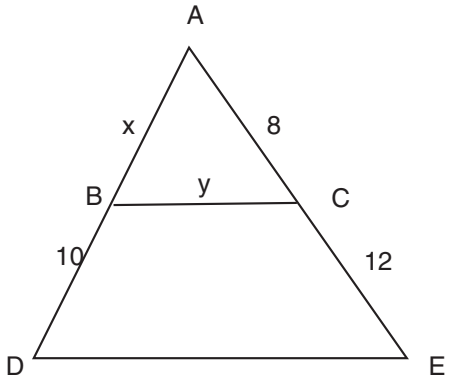
   (c) Draw any line segment and divide it into three congruent parts.

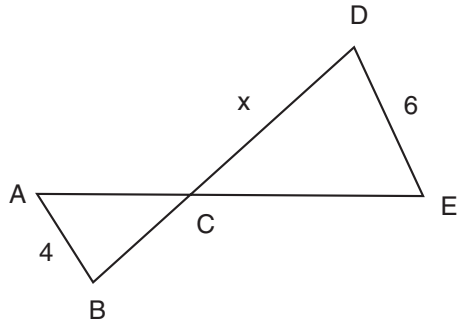
   (d) Draw 2 distinct parallel lines, l and m. Select any point P located between the lines. Construct a circle that passes through P and is tangent to l and m. (You should come up with a construction method that will work no matter how the point P is selected.)

   (e) Draw any acute triangle. Construct a similar triangle whose sides are twice as long as the original ones.

2. In each of the following, find x and y, if possible. Explain what you do, or why it is not possible to find the value, as appropriate.

   In the first figure, the line BC is parallel to DE, and in the second, x represents the length of a side of the triangle, not the whole line you see in the figure. *(4 points each)*





3. For which of the following figures is it possible to construct a circle that circumscribes the figure? Justify your answers. If a circumscribing circle does exist, exhibit the construction in a particular example. *(4 points each)*

   (a) a rectangle

   (b) an isosceles trapezoid

   (c) a rhombus that is not a square

4. Answer question 3 for an inscribed circle. *(4 points each)*

5. A girl wants to calculate the height of her family's teepee. She is 112 cm tall and she finds that when she is inside and stands so that her head touches the side, her feet are 64 cm from the edge. If the teepee is a right circular cone with a diameter of 352 cm, what is its height? *(6 points)*

6. In each of the following, answer *True* or *False*. Justify your answers. *(4 points each)*

   (a) Congruent triangles are similar.

   (b) Two similar triangles are also congruent triangles.

   (c) Any two equilateral triangles are similar.

   (d) Two isosceles triangles are similar.

   (e) The diagonals of a trapezoid divide it into four triangles, two of which similar.

   (f) If three sides of one triangle are parallel, respectively, to three sides of a second triangle, then the triangles are similar.

7. Suppose you have three straight sticks of lengths 10 cm, 20 cm, and 31 cm. Can you arrangle these sticks into a triangle? Explain. *(6 points)*

8. Use the fact that two lines are parallel if they have the same slope to explain why the following points form the vertices of a parallelogram. *(6 points)*

   $A(3,4)$, $B(5,8)$, $C(8,3)$, $D(6,-1)$

9. Determine the equation of the line containing the points A and B from question 8. *(6 points)*