Math 318 Study Sheet for Test 3

You will not be allowed to use a calculator on this test. Make sure that, where appropriate, your work and reasoning is neat and clear. Make sure that all of your answers are clearly indicated.

1. Suppose the midsection of a trapezoid is 15 centimeters long. What can you conclude about other components of the trapezoid?
2. Suppose the midsection of a triangle is 4 inches long. What does this tell you about any other components of the triangle?
3. Draw a trapezoid and its midsection.
4. Draw a triangle and its midsection.
5. Draw a cyclic quadrilateral.
6. Draw a triangle and one of its medians.
7. Draw a triangle and one of its perpendicular bisectors.
8. Which of the 4 "centers" of a triangle will always be collinear?
9. What is the sum of the interior angles of any decagon?
10. What is the sum of the interior angles of any nonagon?
11. Use patty paper (it will be provided) to do the following:
    (a) Start with a segment AB and a point C not on the segment. Create a line that is parallel to segment AB and that goes through point C.
    (b) Start with a segment AB and a point C not on the segment. Create a line that is perpendicular to segment AB and that goes through point C.
    (c) Start with a segment AB. Make a square, one side of which must be the segment AB.
    (d) Start with a segment AB. Make a parallelogram, with no right angles and not all sides equal lengths, with segment AB being one side of the parallelogram.
12. Describe the activity shown in class that involved a string and a paper clip, among other things.
13. Complete this sentence: The circumcenter of a triangle is the center of _____
14. Suppose you have a scalene triangle and its incenter. Is there a special relationship between the triangle's incenter and the triangle's vertices? If so, what is it? Is there a special relationship between the triangle's incenter and the triangle's sides? If so, what is it?
15. Suppose the 4 vertices of quadrilateral ABCD lie on the same circle. What can you conclude about any components about quadrilateral ABCD?
16. Describe Napoleon's Theorem.
17. If thee sides of a triangle are 2 inches long, 4 inches long, and 5 inches long, is this triangle a right triangle? Explain.

18. The dead Greek dude credited with writing down all the Greeks' knowledge of geometry in 300 B.C. is

    (a) Euler

    (b) The Edmonton Oilers

    (c) Euclid

    (d) the star of "My Big Fat Greek Wedding"

    (e) Pythagoras

    (f) Achimedes

    (g) Jimmy the Greek

    (h) Michael Dukakis

    (i) Plato

19. Indicate whether each statement is true or false:

    (a) The centroid of a triangle is the intersection of the three angle bisectors of the triangle.

    (b) Opposite interior angles of a quadrilateral are supplementary.

    (c) In a right triangle, the sum of the two angles that are not 90° is 180°.

    (d) The three altitudes of a triangle meet at the triangle's midcenter.

    (e) The three perpendicular bisectors of a triangle meet at the triangle's circumcenter.

    (f) The sum of the squares of two sides of a triangle is equal to the square of the third side.

    (g) The three angle bisectors of a triangle meet at a point which is equidistant from the midpoints of the sides of the triangle.

20. Suppose ABCD is a quadrilateral. Suppose E, F, G, and H are the midpoints of the sides of quadrilateral ABCD. What can you say about quadrilateral EFGH?

21. Suppose $\triangle FUN$ is a scalene triangle. Suppose you must make a new triangle using a side that is twice as long as segment UF, another segment that is twice as long as segment UN, and $\angle FUN$. What can you say about the new triangle and any of its components?

22. Complete this sentence: An exterior angle of triangle is equal to _____.