Math 202 Final Exam Name_____
200 pts. Fall 2001

1. Fill in the blanks with the correct value. (12 pts – 4 pts each)

   a. A pyramid with 10 faces has _____ edges.

   b. 25 is _____% more than 10.

   c. The two-hour final exam is _____ times as long as the 4/3 hour long regular class session.

2. If possible, draw an example of each of the following. If not possible, explain why. (16 pts – 4 pts each)

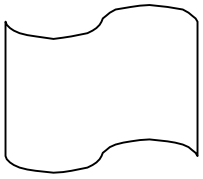
   a. A rhombus that is not a parallelogram.

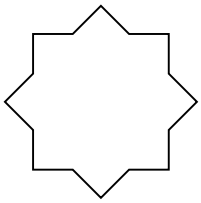
   b. A trapezoid that is not a parallelogram.

   c. A square that is not a kite.

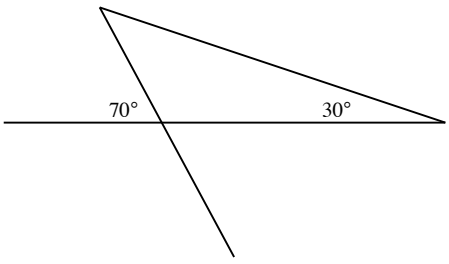
   d. A quadrilateral with 2 lines of symmetry. If possible, draw in the lines.

3. Draw in all lines of symmetry and list all angles of rotation symmetry in each of the shapes below. (8 pts)

   a. 

   b. 

4. What are the measures of the missing angles in the triangle below? (6 pts)

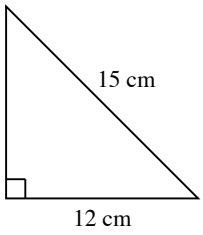


For problems 5 - 15, circle the letter corresponding to the one, best correct response. (6 pts each)

5. Which is the *closest* to the circumference of a circle with a radius of 2.4 meters?

   a. 7.5 m b. 15.1 m c. 18.1 m d. 72.3 m e. None of the above

6. What is the area in cm^2 of a triangle similar to the one below that has undergone a size transformation of factor 3?



   a. 270 b. 54 c. 486 d. 162 e. None of the above

7. What is the surface area, in square units, of a cube with volume 64 cubic units?

   a. 48 b. 384 c. 512 d. 96 e. None of the above

8. The area of this page is about…

   a. 6 cm^2 b. 6 dm^2 c. 6 mm^2 d. 6 m^2 e. 6 km^2

9. If a polygon is equilateral, then it must be:

   a. equiangular b. regular c. a triangle d. None of the above

10. What is the measure of one interior (vertex) angle of a regular 18-gon?

    a. 10° b. 2880° c. 20° d. 160° d. None of the above

11. What is the length of side *n* on the second triangle below?

    a. 2 b. 2.5 c. 4 d. 5 e. None of the above

12. This shows three different views of a three-dimensional figure constructed from cubes.

Which one of the following could be the figure?

a. b. c. d.

13. Ollie measures the area of his kitchen floor and finds that it is 2400 square decimeters. How many square meters is it?

a. 2.4 b. 24 c. 240 d. Not enough information

14. An isosceles triangle has two angles, one with 50°, and the other with 80°. How large is the third angle?

a. 40° b. 50° c. 80° d. 130° e. Need more info

15. The sizes of three interior angles of a quadrilateral are 65°, 35°, and 160°. What is the size of the fourth angle of the quadrilateral?

a. 20° b. 60° c. 100° d. 140° e. None of the above.

16. Circle T or F to indicate whether each statement below is True or False. (8 pts)

a. T F The radius of a sphere is the longest segment possible inside the sphere.

b. T F If the radius of sphere A is equal to the radius of sphere B, the two spheres have the same volume.

c. T F Every square is a special rectangle.

d. T F A circle is a special polygon.

17. Which nets will fold to make a pyramid with a square base? Circle all of the letters that correspond to the correct nets. (6 pts)

The rest of the questions on this exam require work to be shown to support your answer. Choose any **eight** of the remaining 10 questions, numbered from 18 through 27, and answer those eight. Circle the eight questions you want graded. If none are circled, I will grade the first 8 questions attempted, in order, starting with question 18. (10 pts each)

18. Find the surface area and volume of the figure pictured below.

19. Suppose I reported the length of a shark to be 2.36 meters. What range would you expect the actual length of the shark to lie in? Explain your answer.

20. Develop the formula for the volume of the sphere, as discussed and modeled in class.

21. a. Find the area of the figure on the grid at the right. (5 pts)

b. Find the perimeter of the same figure in part a. (5 pts)

22. Illustrate the Pythagorean Theorem through an appropriately labeled sketch, and explain conceptually why the theorem makes sense, by looking at your work.

23. Find the amount of metal used to construct a soup can, measuring 13 cm tall, and having a base with diameter of 8 cm.

24. What is the area of the hexagonal region below, in square centimeters? Assume that lines that look parallel are parallel, and that angles that look like right angles are right angles.

25. After working with prisms and pyramids in class, one of your students says, "There is no way for the number of edges, the number of vertices, and the number of faces to ALL be odd numbers." You then ask the student to support his/her answer. Do you agree or disagree with the original statement? How do you support <u>your</u> answer?

26. a. What are the two conditions which need to be satisfied at the vertex of any convex polyhedron? (4 pts)

b. Using these two ideas, explain why the dodecahedron is the only possible regular convex polyhedron composed entirely of pentagons, as discussed in class. (6 pts)

27. Given that s and t are parallel lines, use the drawing below to prove the Angle Sum in a Triangle theorem. You may not use a protractor to measure angles.