Prof. Brick **Math 202, sec 101, Exam 2 Review** **Su'04**

0. Go over all the homework, quizzes, your notes, and other problems from the book.

1. Prove that the measure of an exterior angle of a triangle is greater than the measure of either of the opposite interior angles.

2. Here are a few facts: there are 3 teaspoons to a tablespoon and 4 tablespoons to a quarter cup; there are 8 ounces to a cup; a coffee cup holds 6 ounces. Using these facts, determine how many teaspoons of sugar should be added to a cup of coffee if you want to have 1 part sugar to 12 parts liquid. Be explicit about how you use the units.

3. Find the height of an altitude of an equilateral triangle with unit sides.

4. Can a straight line transversely intersect a simple closed curve exactly 309 times ?

5. During an interval of twenty minutes, through how many degrees does the minute hand of a clock move ? the hour hand ?

6. Draw a tetrahedron when viewed from above (so there are no hidden lines). Is it possible or impossible to draw it without retracing and/or lifting your pen ?

7. Define the mathematical terms: rhombus, convex, and obtuse.

8. Explain in what way the following verse has mathematical significance:
Now I will a rhyme construct,
By chosen words the young instruct.
Cunningly devised endeavour,
Con it and remember ever.
Widths in circle here you see,
Sketched out in strange obscurity.

9. Explain what a net is. Then draw a net for the cube.

10. How many types of regular polyhedra are there ? What type did we construct using an envelope ? Name all the other regular polyhedra.

11. MathTomato Inc produces canned tomato products. Their cans are cylinders with height 4 inches and diameter of the top being 1 inch. Find the volume (with units) of the cans. Without recalculating, say what would happen to the volume if each dimension is tripled.

12. A polyhedron is made up of 5 squares and 2 pentagons. Find the number of edges and the number of vertices. Explain your reasoning.

13. At noon a car leaves town heading due west at 45mph. At 1pm a second car leaves town heading due south at 30mph. How far apart (as the crow flies) are the two cars at 2:20pm ?

14. State the formulas for the area and circumference of a circle of radius r. Then find the circumference of a circle with area 4π square meters.

15. Define in words and figures each of the terms "trapezoid, scalene, annulus, supplementary angles, and convex.".

16. A right triangle Δ has a hypotenuse of length 15. One of the other sides is of length 5. Find the area of Δ

17. Find the volume and surface area of a right cylindrical can whose height is 4 centimeters and whose top has diameter 3 inches (recall 1 meter equals approximately 39.4 inches). Give your answer in metric system units.

18. Find the volume and surface area of a a box of length 25 inches, width 13 inches, and height 3 inches.

19. Find the volume and surface area of a sphere of radius 16 cm.

20. A ten foot ladder is leaning up against a wall. Its top point is 8 feet above the ground. How far from the wall is the base of the ladder ?

21. The exposed part of the floor of a kitchen measures $12' \times 10'$. It is to be tiled using square 9" tiles of rare Mobilium marble. Estimate the number of tiles needed.

22. Draw a picture of an annulus and find its area if the radius of the inner circle is 3 cm and that of the outer circle is 5 cm.

23. Draw a scalene triangle and describe what the word "scalene" means.

24. Find the area of an equilateral triangle whose sides have length 1.

25. A typical juice orange has radius 2 inches. It produces enough juice for one person's breakfast. Using radioactivity, you manage to grow juice oranges of radius 14 inches. How many breakfast servings of juice will it produce ?