

MA 202 Exam 3

Name:

No calculators may be used on this test. Show all your work and write in complete sentences. You will not receive full credit for answers without any explanation.

1. (a) (10 points) State the formula for area of a trapezoid.

(b) Prove this formula. (You should use some diagrams.)

2. (14 points) An ice cream cone is 6 inches high and has an opening 4 inches in diameter. If it is filled with ice cream and given a hemispherical top, how much ice cream is there?

3. (a) (10 points) Define what it means for figure F to be similar to figure G.

(b) Suppose F can be dilated by a scale factor of 3 to form G. Is it true that the area of figure G is 3 times the area of figure F? Why or why not?

4. (24 points) Assume the dots in the lattice are spaced at 1 cm intervals.

(a) Calculate the perimeter of the given lattice polygon. Do not approximate any roots.

(b) Calculate the area of the given lattice polygon.

5. (6 points) Two dogs each have a bone. Fido's bone is similar to Spot's bone. Suppose Fido's bone is 12 inches long and weighs 5 lbs. If Spot's bone weighs 40 lbs, how many inches long is it?

6. (6 points) Joey is trying to calculate the surface area of an object that looks like a pyramid with a square base set on top of a cube. (See the picture on the board.) He tells you that the surface area of this object is equal the surface area of the pyramid plus the surface area of the cube. Is this answer correct? Explain why or why not.

7. (10 points) A rotation has sent P to P' and Q to Q' as shown below.

(a) Find the center of rotation. Label it on the lattice.

(b) Find the approximate turn angle.

(c) Sketch the image of the pentagon $PQRST$ on the lattice.

8. (a) (20 points) Compute the surface area in dm of a right circular cone with a radius of 200 mm and a height of 3 dm.

(b) What is the formula for surface area of a right circular cone in general.

(c) How would you prove this formula to your students. (Your answer should be more than, "I would show many examples.")