### MAT 118 Final Exam
#### Spring 2007

Name: ____________________________

Instructor: (circle one) Dickerson Olanoff Riley

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<th>Question</th>
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Total Score: ________/130

Percentage: _________
1. (5 pts) Justify why this is a good or bad definition of a square: a quadrilateral with four congruent sides.

2. Classify each of the following statements as either TRUE or FALSE. If the statement is false, provide a counterexample or correct the statement.
   a. (4 pts) All trapezoids are parallelograms.
   b. (4 pts) A quadrilateral with all angles congruent is a rectangle.
   c. (4 pts) All rectangles are similar.
   d. (4 pts) Any two equilateral triangles are similar.
3. In the figure below, the circle with center $O$ has a radius of 5 cm. In addition, $AC \perp OB$.

a. (5 pts) Find the area of the shaded region.

b. (5 pts) Find the perimeter of the shaded region.

4. Given the diagram below with $a \parallel b$, find the following angle measures:

a. (3 pts) $m\angle 1$

b. (3 pts) $m\angle 2$

c. (3 pts) $m\angle 3$
5. (10 pts) Peter says that most SUPER SALES are misleading. "Why can't they just say an item's price is discounted 60% instead of saying take an additional 50% off of the item's price which has already been discounted 10%? It's the same thing in the end."

Do you agree with Peter or disagree? Justify your answer with mathematical reasoning.

6. Given the diagram below, answer the following questions:

![Diagram](image.png)

a. (5 pts) What multiplication sentence indicates how the shaded fraction is obtained?

b. (5 pts) What fraction is shaded?
7. Answer the following questions by showing the appropriate operation and computation that corresponds to the question.

a. (5 pts) What is two-fifths of ten?

b. (5 pts) How many thirds are in four-fifths?

8. The ratio of boys to girls in Ms. Jones' class is 5:7. If there are a total of 36 students in the class, how many are boys? How many are girls? Justify your answers.

9. Use the following numbers to answer the questions below:

\[ \sqrt{25} , 0 , 0.62 , 3.14114114114114... , -2.571 , \pi , \sqrt{3} \]

a. (5 pts) Which numbers above are irrational numbers? How do you know?
b. (5 pts) For the numbers above that are rational numbers, write them as fractions.

10. (10 pts) Illustrate $0.8 + 0.3$ by drawing a model using base-10 blocks. Explain your model and solution. Give your answer as a fraction.