Math 220
Spring 2007 Final Exam
T. Lowndes

No cell phones or calculators allowed.

**Show ALL work clearly!**

1. FILL IN THE BLANKS. DO NOT ROUND. <18 pts>

<table>
<thead>
<tr>
<th>Reduced fraction</th>
<th>Percent</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{7}{16}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$4\frac{1}{2}$</td>
<td></td>
<td>5.04</td>
</tr>
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2. Compute: DO NOT ROUND. <10 pts>

a) $42.53 + 3.027$  
b) $15 - 6.8989$

3. A thin piece of string 80 cm long is formed into a rectangle. If the width is 16 cm,
   a.) what is its length? (include units) <10 pts>
   b.) what is its area? (include units)
   c.) what is its width in meters? <6 pts>

4. Joe went to a bakery to buy a cake for his son’s birthday. He was choosing between a 16-inch circle cake (16 inches across) and a 15-inch square cake. Assuming the cakes had the same thickness and the same price, which would be a better deal? Explain your answer.

Answers
5. A chocolate chip recipe calls for $1 \frac{1}{2}$ cups of sugar to make 12 cookies. If you wanted to make 18 cookies, how many cups of sugar would be needed? Use proportion method. Give your answer as a reduced mixed number.

6. Jocelyn bought a new television set. The total price after the 5% sales tax was added was $87.55. What was the cost of the television set without the sales tax? Fill in the blanks. Let X be your unknown, then solve. Show all steps clearly. Round to the nearest cent if necessary.

$\_\_\_\_\_\_\% \hspace{1cm} \text{OF} \hspace{1cm} \_\_\_\_\_\_\_ \hspace{1cm} \text{IS} \hspace{1cm} \_\_\_\_\_\_\_$

7) Find the area and perimeter of the following. Give exact answers. Assume all measurements are in inches. Include units with your answer.

8. Work the following problems: <8 pts>

a) $54 - (-25)$

b) $-32 - (-45)$
9. Write in words 4123.456 using the work “and” and not “point”.

10. Round 3474.0621 to the nearest
   a.) ten   e) one
   b.) tenth  f) thousand
   c.) hundred   g) thousandth
   d.) hundredth

11. Find the area of the following figure using yards.

12. Write yes or no. Is \(36\) a whole number? __________
    an integer? __________
    a rational number? __________
    a real number? __________
    an irrational number? __________

13. Use models (words and pictures) to explain each of the following. <10 pts>
   a) \(-4 + 7\)
   b) \(-1 - (-2)\)

14. (9 pts) Put in order from smallest to largest. Put the LETTER in the blanks.
   \[ A = 2.817, \ B = 3\%, \ C = 400\%, \ D = \frac{16}{37}, \ E = 2.5, \ F = \sqrt{17}, \ G = 3^2, \ H = \frac{18}{5}, \ I = \pi \]
   ______, _______, _______, _______, _______, _______, _______, _______, _______
15. Determine the perimeter and area for the following isosceles triangle. Include units.

\[
\text{Perimeter}_\triangle = \quad <8 \text{ pts}>
\]

\[
\text{Area}_\triangle = 
\]

16. (20 pts) Work the following problems using Order of Operations. Show each step as if you were teaching.

a) \[16 - 4 \div 2 \times 7\]

b) \[10 + 5 \left[16 -2 \left(4 + 1\right)\right]\]

c) \[4(6+1) - 3^2 + \left[2(5-1)+8\right]\]

d) \[18 \div \left[3(7-5)\right] - \sqrt{16} = \]

17. (7 pts) Find the perimeter of the following figure. Assume that the horizontal and vertical distance between adjacent dots is 1 unit. Give an exact answer.

The simplified exact answer for perimeter is:
18. (7 pts) Find the area of the following figure. Assume that the horizontal and vertical distance between adjacent dots is 1 unit. Show your work. Do not use Pick’s Theorem.

Answer: Area is:

19. (8 pts) Perform the following conversions by one of the methods shown in class.

   a) 4 cm to hm
   b) 4 cups to quarts

20. Use percent number sense to answer the following. Use pictures or explain. Do not multiply.

   a) What is 75% of 80?
   b) What is 125% of 12?

21. Give an example of increasing a number by 30% and then decreasing your result by 30%. Show this doesn’t yield the original number.

22. Write true or false in the blank.

   a) All isosceles triangles are equilateral.
   b) All rhombuses are kites.
   c) All right triangles are scalene.
   d) An obtuse triangle can have two obtuse angles.
23. Fill in the string diagram with the appropriate letters. Hatch or shade any region that is impossible to get a shape for.

A) 

B) 

C) 

D) 

E) 

F) 

G)
1. 

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<tr>
<td>( \frac{7}{16} )</td>
<td>43.75%</td>
<td>.4375</td>
</tr>
<tr>
<td>( \frac{9}{200} )</td>
<td>4( \frac{1}{2} )%</td>
<td>.045</td>
</tr>
<tr>
<td>( \frac{51}{25} )</td>
<td>504%</td>
<td>5.04</td>
</tr>
</tbody>
</table>

2. a) 45.557  
   b) 8.1011

3. a) 24 cm  
   b) 384 cm²  
   c) .16 m

4. \( A_{\square} = 15 \times 15 = 225 \text{ in}^2 \)  
   \( A_{\bigcirc} = \pi (8)^2 = 64(3.14) \)  
   \[ = 200.96 \text{ in}^2 \] 
The square cake is the better deal.

5. \[ \frac{1}{2} = \frac{x}{12} = \frac{18}{x} \]  
   \( 12x = 27 \)  
   \[ x = \frac{27}{12} = \frac{3}{4} \]  
   6 cups

6. 105% of \( x \) is 87.55  
   \[ 1.05x = 87.55 \]  
   \[ x = \frac{87.55}{1.05} \approx 83.38 \]

7. Area = 52 + 8\( \pi \) in²  
   Perimeter = 26 + 4\( \pi \) in²

8. a) 54 + 25 = 79  
   b) –32 + 45 = 13

9. Four thousand one hundred twenty-three and four hundred fifty-six thousandths

10. a) 3470  
    b) 3474.1  
    c) 3500  
    d) 3474.06
    e) 3474  
    f) 3000  
    g) 3474.062
11. \(4(5) = 20\text{yd}^2\)

12. a whole number? yes  
an integer? yes  
a rational number? yes  
a real number? yes  
an irrational number? no

13. a) +3  
b) +1


15. Perimeter\(\Delta = 8 + 5 + 5 = 18\) cm  
Area\(\Delta = \frac{1}{2}(8)(3) = 12\) cm\(^2\)

16. a) 2  
b) 8  
c) 35  
d) 35

17. Perimeter = \(6 + 7\sqrt{2} + 3\sqrt{5} + \sqrt{17}\)

18. Area = \(10 + 1 + 2 + 4.5 + 2 + 2 + 1 + 1 = 25.5\)

19. a) .0004 hm  
b) 1 qt

20. a) 60  
b) 15

21. 100 + 30% of 100 = 130  
130 – 30% of 130  
130 – 39 = 91  
100 \(\neq\) 91

22. a) F  
b) T  
c) F  
d) F

23. trapezoid  
parallellogram  
C, D, E  
A, F  
G  
Concave