

Practice Midterm 1  
Math 130

Please take the test under exam conditions. It is designed to take 75 minutes so it would be beneficial if you timed yourself. However, all of the questions are important, so if you have difficulty with some of the topics, please come get help before the actual exam!

1. (10 pts) Perform the division  $525 \div 14$  using the algorithm of your choice. Then write out the same computation in detail using expanded form.
2. (10 pts) Use the partial product algorithm to calculate  $32 \times 24$ . Illustrate the meaning of this algorithm using a rectangular array diagram.
3. (10 pts) If the statement is true for all values of  $a, b, c$  say which operation property it uses, if it is false, find a small counterexample.
  - (a)  $a \times b = b \times a$
  - (b)  $a - b = b - a$
  - (c)  $a \div (b + c) = a \div b + a \div c$
  - (d)  $a = a + 0$
  - (e)  $(a \times b) \times c = a \times (b \times c)$
4. (20 pts) Write a teacher's solution for the following problems:
  - (a) Miss Garcia sold 96 tarts at a food fair. The tarts were sold in boxes of 12 tarts each. She sold all the tarts at \$7 per box. How much money did she receive?
  - (b) There are three times as many boys as girls. If there are 24 more boys than girls, how many children are there all together?
5. (10 pts)
  - (a) Write a word problem that can be solved more easily using estimation than direct computation (it may help to phrase it as a yes or no question).
  - (b) Write the estimation you used to solve your question from (a) as a mathematical expression, e.g.  $57 \times 63 \approx 60 \times 60 = 3600$ .
6. (10 pts) A student proposes the following (incorrect!) algorithm for rounding to the nearest hundred:  
To round a number to the nearest hundred, first round the ones to the nearest ten, then round the tens to the nearest hundred. For example,

$$\begin{aligned} 274 &\approx 270 \\ &\approx 300 \end{aligned}$$

- (a) Write a number that would round to a different number in the standard rounding algorithm than in this student's algorithm.
- (b) What would you say to the student to explain why the answer he got in (a) is wrong, rather than just different?
7. (15 pts) In the following student work for the **bolded** questions, identify whether the student has the correct answer, say what strategy the student is using, and if any equals signs are used incorrectly, write a corrected version.

(a) **213-186=?**

$$186+14=200$$

$$200+13=213$$

$$14+13=27$$

$$\boxed{213 - 186 = 27}$$

(b) **275+22=?**

$$275 + 20 = 295 + 2$$

$$= 297$$

$$\boxed{275 + 22 = 297}$$

8. (15 pts)

- (a) Write a word problem that models the expression  $10 \div 0$ . Use either the partitive or measurement model of division in your question.
- (b) Which model (partitive or measurement) does your question use?
- (c) In the context of your word problem, explain why there is no number that would make sense as an answer.