

Math 130 Final Exam, Wiesner

Name:

1. Write a story problem that would require the problem solver to divide one fraction by another. (You do not have to solve the problem.) (8 points)

2. Explain how to do the following addition problem:

$$\frac{2}{3} + \frac{4}{5}$$

In your explanation, be sure to explain why it makes sense to do each step that you are doing. You are welcome to use pictures or analogies to real-world situations (i.e. pizzas and pies). (22 points)

3. Choose one of the following questions to answer. Please circle the problem you have chosen. (15 points)

(a) Write $1.025252525\dots$ as a common fraction.

(b) If you convert $\frac{7}{43}$ to a decimal, will it be a repeating/terminating decimal or will it be a nonrepeating decimal? Justify your answer. (Recall that we can think of a terminating decimal as a special kind of repeating decimal.)

4. Choose one of the following questions to answer. Please circle the problem you have chosen. (5 points)

(a) Find $LCM(30, 45)$.

(b) Find $GCD(18, 24)$.

5. At McDonald's, Chicken McNuggets get sold in packages of 6 and 9. Can you order *exactly* 100 McNuggets? Justify your answer. (13 points)

6. In *The Locker Problem*, we found that the only numbers that have an odd number of factors are perfect squares. Can you describe the numbers that will have exactly 3 factors? (13 points)

7. The *Best Band Ever* will be playing in Madison this Friday and Saturday. There are 100 tickets for sale for the Friday night show and 150 tickets for sale for the Saturday night show, and 300 people wait in line to buy tickets. Some people want to go to both shows, and so they buy tickets for both nights. However, no one buys tickets for their friends. (In other words, each person buys at most one ticket for each show.)

(a) Draw a Venn diagram to represent this situation. Your diagram should represent the people who buy tickets for each of the shows. Be sure to indicate what your sets are and what your universe is. (6 points)

(b) Redraw your picture and shade in the region of the diagram that represents the people who buy tickets to both shows. (4 points)

(c) Represent symbolically the set of people who buy at least one ticket. (5 points)

(d) Suppose that 25 people buy tickets to both shows. (You can also assume that everyone in line buys at least one ticket until the tickets run out.) How many people are unable to buy any tickets? Justify your answer. (9 points)