Exam 3 Fall 2003 Name _____
T101

1. (*5 pts*) True or False (write the entire word!):
   (a) The question $\frac{3}{4} \div \frac{5}{6}$ can be answered by solving the equation $\frac{3}{4}x = \frac{5}{6}$. _____
   (b) If ratio of Jim's money to Harold's money is $3:5$, by the definition of ratio, there is a unit such that Jim's money measures 3 units and Harold's money measures 5 units. _____
   (c) A ratio is a number, i.e., two ratios can be added, subtracted, multiplied, and divided. _____
   (d) A negative number minus a negative number is always negative. _____
   (e) $|a| = -a$ for all integers a._____

2. (*4 pts*) State the definition of proportion.

3. *(4 pts)* Use mental math to compute the following. Write down your answer in a way that clearly shows the steps involved in solving the problem mentally.

   a. $(\frac{3}{8} \div \frac{4}{8}) \cdot \frac{8}{15}$

   b. $\frac{\frac{38}{51}}{\frac{19}{17}}$

4. (*5 pts)* In the problem,

   > "A factory has 600 workers. 250 of them are men and the rest are women. How many percent more women than men are there?",

   what is the percent out of? (i.e., what is the whole unit?)

5. (*7 pts*) Simplify as much as possible. Your answer should be a fraction in simplest form. *(Hint: Slow is better – write down every step! Neatness also helps.)*

$$5 - \left(\frac{1}{6} \div \left(\frac{1}{3} - \frac{1}{5}\right)\right)$$

6. (*5 pts)* $\frac{2}{5}$ of a number is 42. What is $\frac{1}{3}$ of the number?

Give teacher solution's for the following word problems. You will be graded on your explanation as well as the correctness of the solution. Simplify all answers as much as possible.

7. (*9 pts*) Dick has twice as much money as Tom. They have \$240 altogether. If Dick gives \$20 to Tom, what will be the new ratio of Dick's money to Tom's money?

8. (*9 pts*) $\frac{2}{3}$ of David's money is equal to $\frac{1}{2}$ of John's money. What is the ratio of David's money to John's money?

9. (*9 pts*) Mr. Wu sold his car at a loss of 25%. If the selling price of the car was \$33 000, find the original cost of the car.

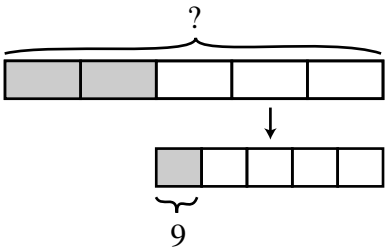
10. (*9 pts*) There are 30% more boys than girls in a club. If there are 54 more boys than girls, how many children are there altogether?

11. (*8 pts*) Make up an interesting, short, realistic, one-step measurement division word problem which corresponds to $30 \div \frac{3}{5}$.

12. (*6 pts*) Illustrate $-3 + 8$ using a vector model.

13. (*5 pts*) Use a pattern to show that $-2 \times 3 = -6$.

14. (*8 pts*) Make up a two-step fraction word problem such that the bar diagram in the teacher's solution is:



15. (*7 pts*) Prove that $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$ using the arithmetic properties and fraction rules.