**Math 125 Homework Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Section 6.3A**

1. Use a number line to illustrate how $\frac{1}{3}×5$ is different (in concept) from $5×\frac{1}{3}$.
2. Use the Chapter 6 eManipulative activity *Multiplying Fractions* on our Web site or the rectangular area model to sketch representations of the following multiplication problems.
3. $\frac{1}{3}×\frac{2}{5}$ **b.** $ \frac{3}{8}×\frac{5}{6}$ **c.** $\frac{2}{3}×\frac{7}{10}$
4. What multiplication problems are represented by each of the following area models? What are the products?

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 **b.**

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1. Find reciprocals for the following numbers.
2. $\frac{11}{21}$ **b.** $\frac{9}{3}$ **c.** $13\frac{4}{9}$ **d.** 108
3. **a.** Insert the appropriate equality or inequality symbol in the following statement:

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

1. Find the reciprocals of $\frac{3}{4}$ and $\frac{3}{2}$ and complete the following statement, inserting either < or > in the center blank.

reciprocal of $\frac{3}{4}$ reciprocal of $\frac{3}{2}$

1. What do you notice about ordering reciprocals?
2. Identify which of the properties of fractions could be applied to simplify each of the following computations.
3. $\frac{5}{7}×\frac{2}{9}×\frac{7}{5}$ **b.** $\left(\frac{3}{5}×\frac{2}{11}\right)+\left(\frac{2}{5}×\frac{2}{11}\right)$ **c.** $\left(\frac{8}{5}×\frac{3}{13}\right)×\frac{13}{3}$
4. Suppose that the following unit square represents the whole number 1. We can use squares like this one to represent division problems like 3$÷\frac{1}{2}$, by asking how many $\frac{1}{2}$s are in 3. 3$÷\frac{1}{2}=6, $since there are six one-half squares in the three squares. Draw similar figures and calculate the quotients for the following division problems.
5. $4÷\frac{1}{3}$
6. $2\frac{1}{2}÷\frac{1}{4}$
7. $3÷\frac{3}{4}$
8. (Deleted)

1. Use the common-denominator method to divide the following fractions.
2. $\frac{15}{17}÷\frac{3}{17}$
3. $\frac{4}{7}÷\frac{3}{7}$
4. $\frac{33}{51}÷\frac{39}{51}$
5. Use the fact that the numerators and denominators divide evenly to simply the following quotients.
6. $\frac{15}{16}÷\frac{3}{4}$ **b.** $\frac{21}{27}÷\frac{7}{9}$
7. $\frac{39}{56}÷\frac{3}{8}$ **d.** $\frac{17}{24}÷\frac{17}{12}$
8. Perform the following operations and express your answer in simplest form.
9. $\frac{4}{7}×\frac{3}{8}$
10. $\frac{6}{25}×\frac{5}{9}×\frac{3}{2}$
11. $\frac{2}{5}×\frac{9}{13}+\frac{2}{5}×\frac{4}{13}$
12. $\frac{11}{12}×\frac{5}{13}+\frac{5}{13}×\frac{7}{12}$
13. $\frac{4}{7}×\frac{3}{14}$
14. $\frac{2}{9}×\frac{4}{3}×\frac{5}{7}$
15. $\frac{7}{15}×3\frac{1}{2}×\frac{3}{5}$
16. $\frac{7}{11}÷\frac{11}{7}$
17. $\frac{1}{3}×\left(\frac{5}{4}-\frac{1}{4}\right)×\frac{5}{6}$
18. $\frac{1}{3}+\frac{5}{4}\left(\frac{1}{4}÷\frac{5}{6}\right)$
19. Find the following products and quotients.
20. $5\frac{1}{3}×2\frac{1}{6}$
21. $3\frac{7}{8}×2\frac{3}{4}$
22. $3\frac{3}{4}×2\frac{2}{5}$
23. $8\frac{1}{3}÷2\frac{1}{10}$
24. $6\frac{1}{4}÷1\frac{2}{3}$
25. $16\frac{2}{3}÷2\frac{7}{9}$
26. Change each of the following complex fractions into ordinary fractions.
27. $\frac{7/9}{13/14}$ **b.** $\frac{2/3}{3/2}$
28. Calculate mentally using properties.
29. $15×\frac{3}{7}+6×\frac{3}{7}$ **b.** $35×\frac{6}{7}-35×\frac{3}{7}$
30. $\left(\frac{2}{5}×\frac{3}{8}\right)×\frac{5}{2}$ **e.** $3\frac{5}{9}×54$
31. Here is a shortcut for multiplying by 25: $25×36=\frac{100}{4}×36=100×\frac{36}{4}=900$

Use this idea to find the following products mentally.

1. $25×44$ **b.** $25×120$
2. $25×488$ **d.** $1248×25$
3. You buy a family-size box of laundry detergent that contains 40 cups. If your washing machine calls for $1\frac{1}{4}$ cups per wash load, how many loads of wash can you do?
4. In April of 2007, about $\frac{250}{999}$ of the oil refined in the United States was produced in the United States. If the United States produced 4,201,000 barrels per day in April of 2007, how much oil was being refined at that time?

(Source: *U.S. Energy Information Administration*)

1. All but $\frac{1}{16}$ of the students enrolled at a particular elementary school participated in the “Family Fun Night” activities. If a total of 405 students were involved in the evening’s activities, how many students attend the school?
2. The directions for Weed-Do-In weed killer recommend mixing $2\frac{1}{2}$ ounces of the concentrate with 1 gallon of water. The bottle of Weed-Do-In contains 32 ounces of concentrate.
3. How many gallons of mixture can be made from the bottle of concentrate?
4. Since the weed killer is rather expensive, one gardener decided to stretch his dollar by mixing only $1\frac{3}{4}$ ounces of concentrate with a gallon of water. How many more gallons of mixture can be made this way?
5. A recipe that makes 3 dozen peanut butter cookies calls for $1\frac{1}{4}$ cups of flour.
6. How much flour would you need if you doubled the recipe?
7. How much flour would you need for half the recipe?
8. How much flour would you need to make 5 dozen cookies?
9. A softball team had three pitchers: Gale, Ruth, and Sandy. Gale started in $\frac{3}{8}$ of the games played in one season. Sandy started in one more game than Gale, and Ruth started in half as many games as Sandy. In how many of the season’s games did each pitcher start?
10. A piece of office equipment purchased for $60,000 depreciates in value each year. Suppose that each year the value of the equipment is $\frac{1}{20}$ less than its value the preceding year.
11. Calculate the value of the equipment after 2 years.
12. When will the piece of equipment first have a value less than $40,000?
13. **a.** Following are examples of student work in multiplying fractions. In each case, identify the error and answer the given problem as the student would.

Sam: $\frac{1}{2}×\frac{2}{3}=\frac{3}{6}×\frac{4}{6}=\frac{12}{6}=2$

 $\frac{3}{4}×\frac{1}{8}=\frac{6}{8}×\frac{1}{8}=\frac{6}{8} \frac{3}{4}×\frac{1}{6}=?$

Sandy: $\frac{3}{8}×\frac{5}{6}=\frac{3}{8}×\frac{6}{5}=\frac{18}{40}=\frac{9}{20}$

 $\frac{2}{5}×\frac{2}{3}=\frac{2}{5}×\frac{3}{2}=\frac{6}{10} \frac{5}{6}×\frac{3}{8}=?$

**b.** Each student is confusing the multiplication algorithm with another algorithm. Which one?

1. Mr. Chen wanted to buy all the grocer’s apples for a church picnic. When he asked how many apples the store had, the grocer replied, “If you added $\frac{1}{4},\frac{1}{5},$ and $\frac{1}{6}$ of them, it would make 37.” How many apples were in the store?