

Practice Exam #3

1. Think about the part-whole characterization of fractions and answer the following questions.

a) Which of the following is bigger (circle one)? $\frac{21}{42}$ or $\frac{21}{41}$

b) Which of the following is bigger (circle one)? $\frac{21}{42}$ or $\frac{20}{42}$

c) Is $\frac{21}{42}$ in simplest form (circle one)? Yes No

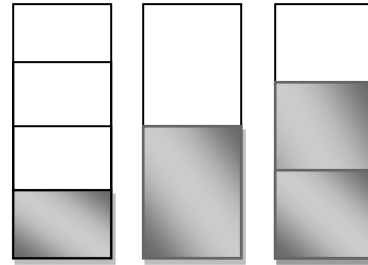
d) Is $\frac{21}{41}$ in simplest form (circle one)? Yes No

e) Is $\frac{20}{42}$ in simplest form (circle one)? Yes No

f) Which of the following is closest to $\frac{1}{2}$? $\frac{21}{42}$ or $\frac{21}{41}$ or $\frac{20}{42}$

g) Which of the following is closest to 1? $\frac{21}{42}$ or $\frac{21}{41}$ or $\frac{20}{42}$

h) If you had to estimate any of the three fractions with a drawing, which of the following would you choose?



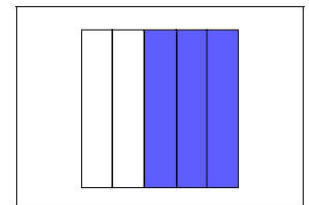
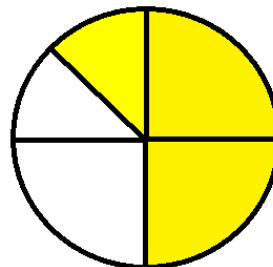
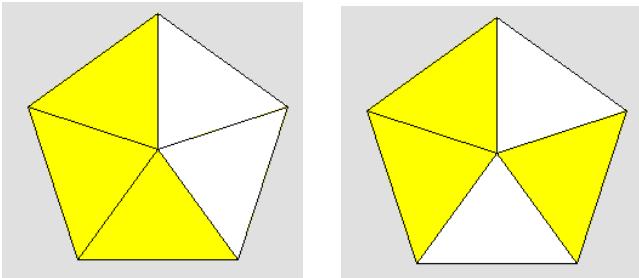
2. Draw the following fractions (a) using a circle or rectangle (b) on a number line (c) using cookies on a cookie sheet. Rewrite each in lowest simplest form and explain why it is the same in both drawings. Convert any which is improper to a proper fraction and explain why the conversion makes sense.

$$\frac{10}{14}$$

$$\frac{33}{8}$$

$$\frac{17}{10}$$

3. Which of the following are acceptable ways to model $\frac{3}{5}$? Explain why or why not.



4. From #3, which representation(s) could be considered discrete? Which could be considered continuous? Explain.

5. Decide whether the following fractions are $<$, $>$, or $=$. Explain why. Which represent a proportion?

$$\frac{4}{10} ? \frac{12}{28}$$

$$\frac{10}{24} ? \frac{15}{36}$$

$$\frac{3}{7} ? \frac{1}{3}$$

6. Write 0.4 as a fraction with the following denominators.

- a. 5
- b. 20
- c. 100
- d. 85

7. Fill in the conversion table between fraction/decimal/percent/ratio. Show your work.

<u>Fraction (simplest)</u>	<u>Decimal</u>	<u>Percent</u>	<u>Ratio (simplest)</u>
	0.8	80%	
		35%	
$\frac{9}{20}$			
			2:1
			3:4
	1.7		
		98%	
$\frac{2}{3}$			
		110%	
	0.004		
	$0.\overline{81}$		
		$44.\overline{4}\%$	

8. **Draw a diagram** to represent the addition of the fractions. Then solve using the rules for adding fractions. Explain how the mathematical procedure is explained by your diagram.

$$\frac{1}{2} + \frac{3}{8}$$

9. **Draw a diagram** to represent the subtraction of the fractions. Then solve using the rules for subtracting fractions. Explain how the mathematical procedure is explained by your diagram.

$$\frac{3}{4} - \frac{1}{5}$$

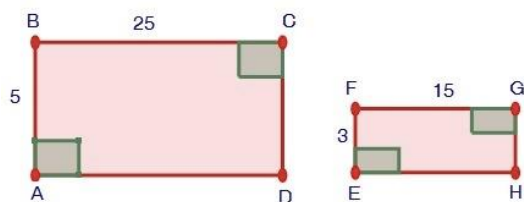
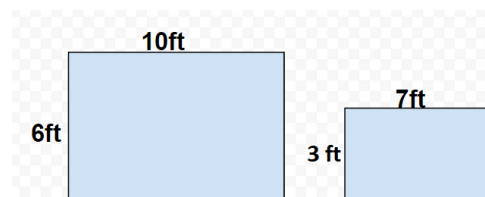
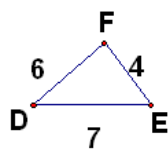
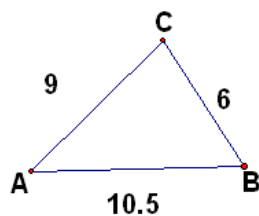
10. **Draw a diagram** to represent the multiplication of the fractions. Then solve using the rules for multiplying fractions. Explain how the mathematical procedure is explained by your diagram.

$$\frac{1}{3} \times \frac{4}{5}$$

11. **Draw a diagram** to represent the division of the fractions. Then solve using the rules for dividing fractions. Explain how the mathematical procedure is explained by your diagram.

$$\frac{5}{6} \div \frac{1}{3}$$

12. Are the following figures proportional? Explain why or why not.



13. Write the following as unit ratios.

- 8:2
- 7:3
- 8:16

14. If I drove 45 miles in 30 minutes, what is this as a unit rate? In mph?

15. Solve the following proportional reasoning question.

“A home in a nice neighborhood in San Diego sells for \$500,000. The size of that home is 2,000 ft². A larger home in the neighborhood has 2,600 ft². How much would you expect it to cost?”

a. Solve using proportional reasoning.

Handwritten work for problem 15a:

$$\frac{\$500,000}{2,000 \text{ ft}^2} = \frac{\$X}{2,600 \text{ ft}^2}$$

$$\frac{1300000000}{2000} = \frac{2600X}{2000}$$

$$X = \$650,000$$

b. Should we be using proportional reasoning to solve this question? Why does it make sense? Why wouldn't it make sense?

16. Place the following numbers on an empty number line (approximately). $\{1.7, 0.77\%, \frac{8}{11}, 0.81, \frac{10}{7}, \frac{8}{9}\}$



17. Consider a candy bar shared between two people, split as Part A and Part B. For each below, draw a candy bar that describes the given description. For each, (i) Write as a ratio A:B (ii) What fraction is A of the whole?

- Part A is $\frac{2}{5}$ as large as Part B.
- The ratio of Part B to Part A is 4:2.
- Part A is 7 times as large as Part B.
- Part B is $\frac{3}{11}$ of the whole bar.

18. Write a story problem to represent the following operations. Solve and explain your solution conceptually.

- $4\frac{1}{4} + 1\frac{1}{2}$
- $4\frac{1}{4} - 1\frac{1}{2}$
- $4\frac{1}{4} \times 1\frac{1}{2}$
- $4\frac{1}{4} \div 1\frac{1}{2}$

19. Identify the operation in the problem and solve using the proper algorithm for fraction operations.

- A cake recipe requires $1\frac{2}{3}$ cup of flour. If you want to make six cakes, how much flour do you need?
- A baking recipe calls for $2\frac{3}{4}$ cup of sugar. If you only have $1\frac{1}{6}$ cup, how much sugar do you need?
- You have $6\frac{3}{4}$ bags of sugar. Your cookie recipe calls for $\frac{2}{3}$ cup. How many recipes can you make?
- A cooking recipe calls for $\frac{2}{3}$ cup of oil, while another calls for $1\frac{1}{2}$ cup. How much oil do you need?