

Week in Review # 10

MATH 365

Section 5.3

Marcia Drost

©Drost, 2005

Created and compiled by Sherry Scarborough with thanks for additional problems from Zach Barcevac, Lynnette Cardenas, Greg Klein, David Manuel, Jane Schielack, and Jenn Whitfield.

1. Given $\frac{a+b}{cd}$. Identify the additive inverse and justify your answer.

2. Jeopardy: Melissa made 3 and $\frac{1}{2}$ gallons of ginger ale, which she intends to bottle in "fifths" (that is, bottles that contain a fifth of a gallon). The answer is 17 full bottles and $\frac{1}{2}$ of another bottle. What is the question?

3. Rewrite $\frac{5}{24}$ and $\frac{11}{98}$ with the same least common denominator.

4. If x , y , and z are integers and $\frac{x}{y} = \frac{x}{z}$, what four things must be true?

5. Insert four fractions between $\frac{3}{4}$ and $\frac{-256}{81}$ so that the six numbers together constitute a geometric sequence.

6. Estimate to the nearest whole number $3\frac{2}{3} - \frac{6}{7} + 9\frac{4}{9} - 6\frac{1}{2} + 2\frac{3}{13}$

7. Circle the properties that hold for division of rational numbers.

closure

commutative

associative

identity

8. Find the number which is one-third of the way from $\frac{3}{8}$ to $1\frac{1}{4}$ on the number line.

9. Model $\frac{1}{4} \cdot \frac{2}{3}$ using the rectangular model.

10. Solve $\frac{1}{5^x} = 625$.

11. Find the product $3\frac{1}{5} \cdot 5\frac{1}{3}$ and write your answer as a mixed number.

12. Fully simplify $\frac{(-5x^3y^{-1}z^4)^{-3}}{4xy^{-5}z^{-2}}$ using only positive exponents in the final answer.

13. A student claims that if x is positive, then $\frac{1}{x} < x$. What is your response?

14. A high school consists of $\frac{2}{5}$ freshmen, $\frac{1}{4}$ sophomores and $\frac{1}{10}$ juniors. What fraction of the class are seniors?

15. Fully simplify: $\frac{\frac{2}{5} - \frac{1}{2}}{7 + \frac{2}{11}} =$

16. Find $\left(2 - 3\frac{6}{7}\right)\left(8\frac{3}{4}\right)$ as an improper fraction in lowest terms.

17. Using the rectangular model, illustrate and compute: $\frac{4}{5} \div \frac{1}{2}$

18. A spool of ribbon contained $25\frac{1}{3}$ yards of brocade ribbon. The ribbon was divided evenly among 4 stores. One store sold all its ribbon. Another store sold $\frac{1}{2}$ of its ribbon. Another store sold $\frac{1}{4}$ of its ribbon. The last store was closed for inventory and sold none of its ribbon. How much of the original ribbon is left?

19. True or False:

a. The additive inverse of the nonzero rational number $\frac{a}{b}$ is $\frac{b}{a}$.

b. $2^{100} = 8 \cdot 2^{97}$

20. Sarah is reading a book. She has finished $\frac{5}{6}$ of the book and has 80 pages left to read. How many pages has she read? [Hint: Define your variable, set up an equation, and then solve your equation.]

21. Find the multiplicative inverse of:

a. -2

b. $-3\frac{4}{9}$

22. Prove $\frac{a}{b} \div \frac{c}{d} = \frac{ad}{bc}$ where $\frac{c}{d} \neq 0$. Show each step.

23. Write each of the following in simplest form using positive exponents in the final answer. Assume all expressions are defined.

a. $\left(\frac{-4}{7}\right)^{-3}$

b. $(-x^{-4}y^2z)^{-5}$

c. $c^3k^9(c^2k^4)$

d. $\left(\frac{x^7}{y^{11}}\right)^{-9}$

e. $\frac{x^{-1}}{x}$

/b

f. $\left(\frac{-2a}{b^{-2}}\right)^3 (ab^4)^6$

g. $\frac{-(9yz^{-4})^2}{13y^5z^{-6}}$

h. $(3nmr)^2(mr^{-1})^{-4}$

$$24. \text{ i. } \frac{25^{32} \cdot 5^0 - 5^3 \cdot 5^{63}}{5^{-1} \cdot 5^{64} + 5^{-2} \cdot 125^{21}}$$

25. A 340-gram jar of wheat germ contains about 26 grams of fat. Use a common fraction to estimate what fraction of the jar of what germ are fat grams.

26. Use the distributive property of multiplication over addition to find the product:

$$7\frac{1}{8} \cdot 4\frac{5}{9}$$

27. Write a story that requires the division $2\frac{3}{4} \div \frac{2}{3}$

28. Explain and justify step-by-step using properties of rational numbers to explain

$$5 \div (3 \div 4) - (5 \div 3) \cdot 4.$$

29. Jacy has money in a savings account. Isabel has half as much in savings as Jacy. Kent has one-third as much in savings as Isabel. If Kent has \$ 30 in savings, how much does Jacy have in savings?

30. Use a mental math technique to find the following product in simplest form.

$$8 \times 4\frac{1}{4}$$

31. Use techniques learned in Math 365 to write the following as a single fraction.

$$\frac{2}{3} - \frac{1}{3} \times \frac{1}{2} + \frac{4}{5} \div \frac{4}{3}$$

A castle in the faraway land of Aluossim was surrounded by four moats. One day, the castle was attacked and captured by a fierce tribe from the north. Guards were stationed at each bridge. Prince Juan was allowed to take a number of bags of gold from the castle as he went into exile. However, the guard at the first bridge demanded half the bags of gold plus one more bag. Juan met this demand and proceeded to the next bridge. The guards at the second, third, and fourth bridges made identical demands, all of which the prince met. When Juan finally crossed all the bridges, a single bag of gold was left. With how many bags did Juan start?