
TEST 3: SPRING 2006

MATH 221: BASIC CONCEPTS OF ELEMENTARY MATHEMATICS I

Name _____

Instructions: Check that your test consists of 25 problems. Put your name in the space provided above. Answer each multiple choice question below. Each problem is worth 4 points with the same scoring procedure as used on the quizzes. A blank page is provided at the end of this test for your work.

1. Which of the following is *not* correct?

- (a) $17 \equiv -2 \pmod{5}$ (b) $17 \equiv 7 \pmod{5}$
(c) $13 \equiv -2 \pmod{5}$ (d) $13 \equiv 33 \pmod{5}$

2. Today is Wednesday, April 19, 2006. There are 365 days this year and 365 days next year, so neither year is a leap year. What day of the week will it be on April 19, 2007?

- (a) Monday (b) Tuesday (c) Thursday (d) Friday

3. Which of the following is a proper fraction?

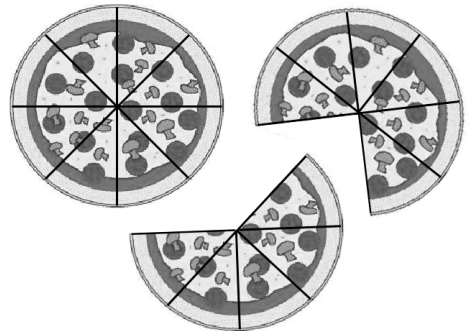
- (a) $\frac{8}{6}$ (b) $\frac{\sqrt{2}}{2}$ (c) $\frac{19}{18}$ (d) $\frac{-12}{18}$

4. Which of the following is the simplest form of $225/315$?

- (a) $\frac{3}{4}$ (b) $\frac{7}{9}$ (c) $\frac{5}{7}$ (d) $\frac{75}{105}$

5. What fraction of the three pizzas is missing to the right?

- (a) $1/3$ (b) $1/6$
(c) $5/24$ (d) $6/25$

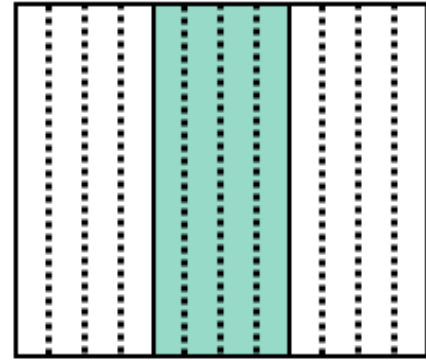


6. One bit is one-eighth of a Spanish dollar. A teacher asks students to start with 21 bits and to exchange the bits for whole Spanish dollars and bits. The point of such an exercise is to teach the students

- (a) unlike with English, every bit counts when doing mathematics.
- (b) how to express fractions as mixed fractions.
- (c) the commutative property of addition.
- (d) the commutative property of multiplication.

7. What equation is the figure to the right illustrating?

- (a) $\frac{1}{4} = \frac{3}{12}$
- (b) $\frac{1}{3} = \frac{4}{12}$
- (c) $\frac{8}{12} - \frac{4}{12} = \frac{1}{3}$
- (d) $\frac{4}{12} - \frac{1}{12} = \frac{1}{4}$



8. Which one of the following is the least useful in explaining to a child why the fractions $\frac{3}{4}$ and $\frac{6}{8}$ are equal?

(a)

(b)

(c)

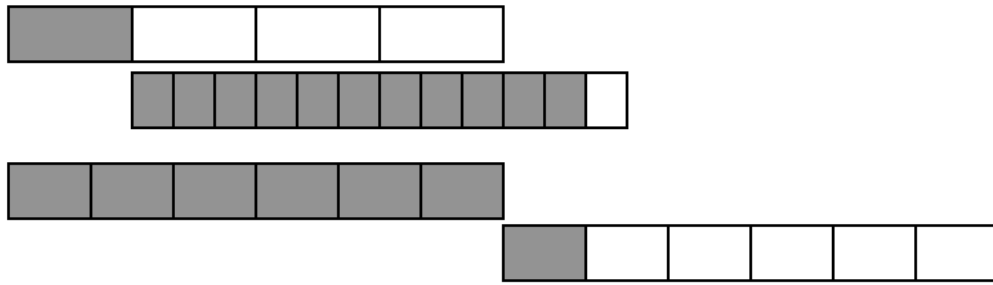
$$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$$

(d)

9. A clerk sold three pieces of one type of ribbon to different customers. One piece was $\frac{1}{3}$ yard long, another was $2\frac{1}{4}$ yard long, and the third was $3\frac{1}{2}$ yard long. What was the total length of that type of ribbon sold?

- (a) $6\frac{1}{12}$ yards
- (b) $6\frac{1}{6}$ yards
- (c) $6\frac{1}{4}$ yards
- (d) $6\frac{1}{3}$ yards

10. The following represents an equation for the sum of two rational numbers.



What is the equation that is represented?

(a) $\frac{1}{3} + \frac{11}{12} = \frac{5}{4}$

(b) $\frac{1}{4} + \frac{11}{12} = \frac{7}{6}$

(c) $\frac{1}{3} + \frac{9}{12} = \frac{13}{12}$

(d) $\frac{1}{6} + \frac{3}{4} = \frac{11}{12}$

11. Which of the following is written in decreasing order?

(a) $\frac{-19}{31}, \frac{-7}{11}, \frac{-19}{30}$

(b) $\frac{-19}{31}, \frac{-19}{30}, \frac{-7}{11}$

(c) $\frac{-19}{30}, \frac{-7}{11}, \frac{-19}{31}$

(d) $\frac{-19}{30}, \frac{-19}{31}, \frac{-7}{11}$

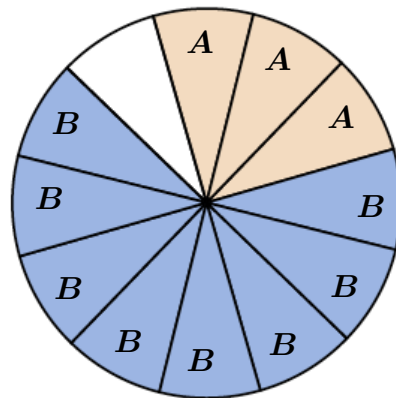
12. The figure to the right illustrates which of the following equations involving addition of rational numbers?

(a) $\frac{2}{3} + \frac{1}{4} = \frac{11}{12}$

(b) $\frac{3}{4} + \frac{1}{6} = \frac{11}{12}$

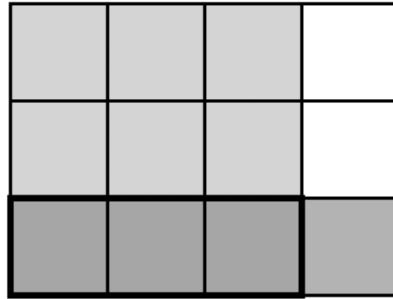
(c) $\frac{3}{10} + \frac{8}{10} = \frac{11}{10}$

(d) $\frac{1}{3} + \frac{3}{5} = \frac{14}{15}$



Note: In this problem, the letters “A” and “B” in the figures indicate two different shades of grey.

13. What multiplication problem is represented by the diagram below?



(a) $\frac{1}{3} \cdot \frac{3}{4} = \frac{3}{12}$

(b) $\frac{2}{3} \cdot \frac{1}{4} = \frac{2}{12}$

(c) $\frac{1}{3} \cdot \frac{1}{4} = \frac{1}{12}$

(d) $\frac{2}{3} \cdot \frac{3}{4} = \frac{6}{12}$

14. Martha has read $\frac{4}{5}$ of a 205-page book. How many pages does she have left to read?

- (a) 36 pages (b) 38 pages (c) 41 pages (d) 44 pages

15. Which of the following is not always true? (Here, a , b , c and d are positive integers.)

(a) $\frac{a}{b} \times \frac{c}{d} = \frac{a}{b} \div \frac{d}{c}$

(b) $\frac{a}{b} + \frac{c}{d} = \frac{a+c}{b+d}$

(c) $\frac{a}{b} \div \frac{c}{d} = \frac{a \div c}{b \div d}$

(d) $\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$

16. When discussing division with rational numbers, we referred to the number of a 's that it takes to get b . With this in mind, the number of $\frac{1}{8}$'s that it takes to get $2\frac{1}{4}$ is

- (a) 18 (b) 19 (c) 20 (d) 21

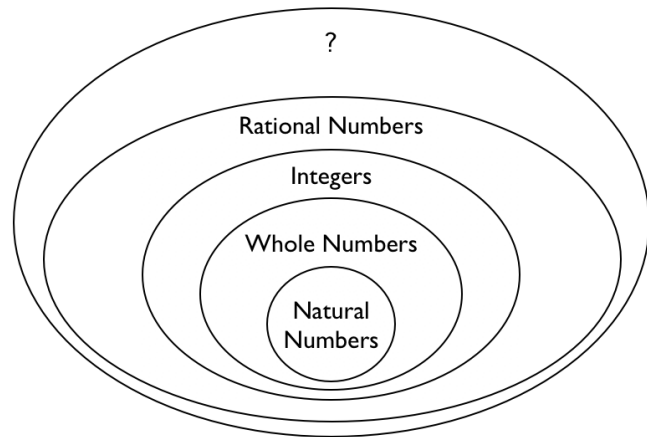
22. If the numbers below are arranged properly on a typical number line, which will be furthest to the right? (Note that these are negative numbers.)

- (a) -0.84 (b) -0.804 (c) -0.8399 (d) -0.80399

23. Which of the following can be written as a terminating decimal?

- (a) $\frac{12}{1440}$ (b) $\frac{23}{1440}$ (c) $\frac{34}{1440}$ (d) $\frac{45}{1440}$

24. The Venn Diagram to the right is missing the name of the bigger set of numbers that includes every number in the largest oval. What is it?



- (a) the real numbers
(b) the irrational numbers
(c) the imaginary numbers
(d) the whopper numbers

25. Which of the following is true?

- (a) The decimal expansion of an irrational number cannot have a pattern.
(b) Most real numbers are irrational.
(c) The number π equals $22/7$.
(d) It is possible to make a list that includes all irrational numbers.