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TEST 3

MATH 221: BASIC CONCEPTS OF ELEMENTARY MATHEMATICS I

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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.

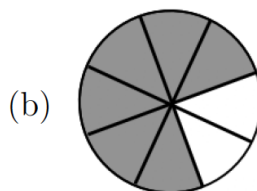
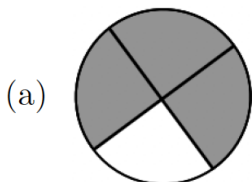
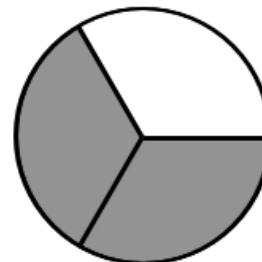
1. What is the least nonnegative integer  $n$  such that  $50 \equiv n \pmod{8}$ ?

- (a) 1                      (b) 2                      (c) 3                      (d) 4

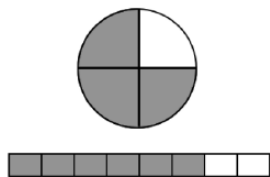
2. Which of the following is true?

- (a)  $\frac{-4}{9} = \frac{-3}{7}$               (b)  $\frac{-4}{9} = \frac{3}{-7}$               (c)  $\frac{-4}{9} > \frac{-3}{7}$               (d)  $\frac{-4}{9} < \frac{-3}{7}$

3. Which picture below represents a fraction equivalent to the fraction represented by the picture to the right?



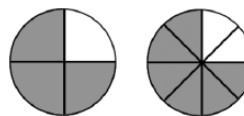
4. Which one of the following is the least useful in explaining to a child why the fractions  $3/4$  and  $6/8$  are equal?



(a)



(b)

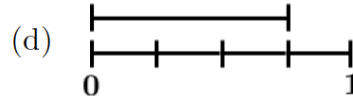
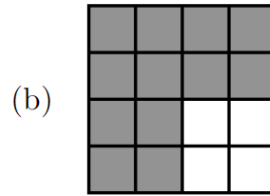
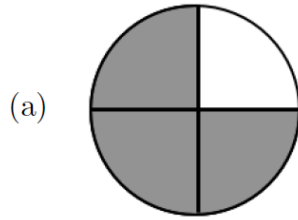


(c)

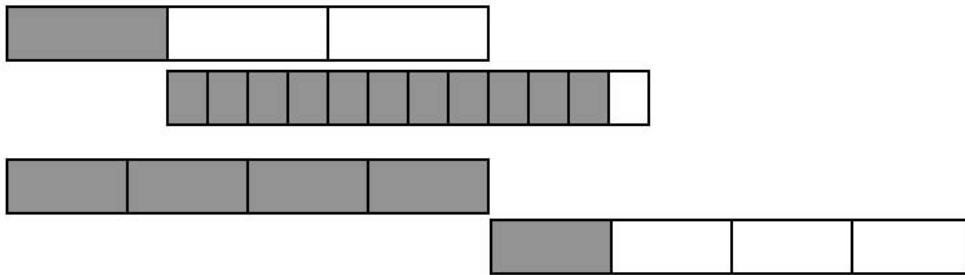
(d)  $\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$

(d)

5. Which figure does not belong? (Each figure represents a fraction. Three of the fractions are equivalent. What is the other fraction?)



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



What is the sum that is represented?

(a)  $(1/3) + (11/12) = 5/4$

(b)  $(1/4) + (11/12) = 7/6$

(c)  $(1/3) + (1/4) = 7/12$

(d)  $(1/4) + (2/3) = 11/12$

7. What is the value of the product  $(3 + \frac{1}{2}) \cdot (2 + \frac{1}{3})$ ?

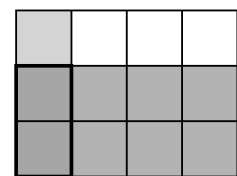
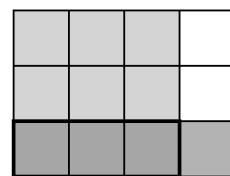
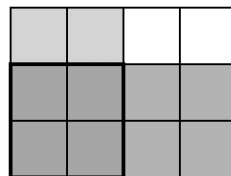
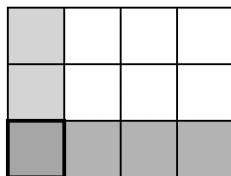
(a)  $7\frac{5}{6}$

(b)  $9\frac{1}{6}$

(c)  $9\frac{5}{6}$

(d)  $8\frac{1}{6}$

8. Which rectangular region illustrates the product  $(\frac{2}{3}) \cdot (\frac{1}{4})$ ?



(a)

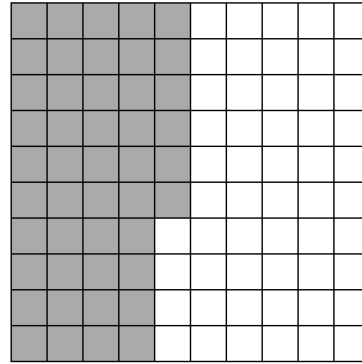
(b)

(c)

(d)

9. Which decimal below is represented by the figure on the right? (The 100 small squares represent 1 unit.)

- (a) 0.32                      (b) 0.37  
 (c) 0.43                      (d) 0.46



10. Exactly three-fourths of the students in a certain class are passing. If 24 of them are passing, how many students are in the course?

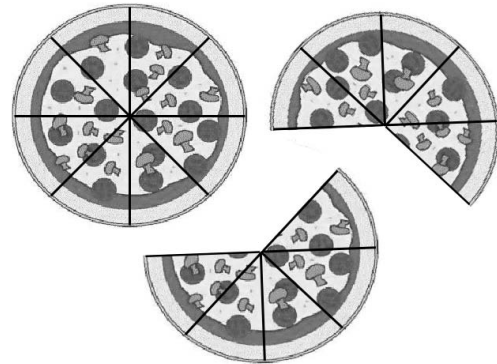
- (a) 18                      (b) 32                      (c) 36                      (d) 42

11. Which of the following is  $(2\frac{1}{2}) \div (1/2)$ ?

- (a)  $1\frac{1}{4}$                       (b)  $2\frac{1}{4}$                       (c)  $1\frac{1}{2}$                       (d) 5

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

- (a)  $1/3$                       (b)  $1/4$   
 (c)  $5/12$                       (d)  $5/24$



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

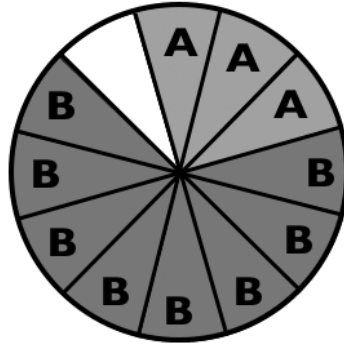
- (a)  $\frac{a}{b} \times \frac{c}{d} = \frac{a}{b} \div \frac{d}{c}$                       (b)  $\frac{a}{b} + \frac{c}{d} = \frac{a+c}{b+d}$   
 (c)  $\frac{a}{b} \div \frac{c}{d} = \frac{a \div c}{b \div d}$                       (d)  $\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$

14. Which of the following is equal to  $28/49$ ?

- (a)  $52/91$                       (b)  $34/85$                       (c)  $269/471$                       (d)  $5714/10^4$

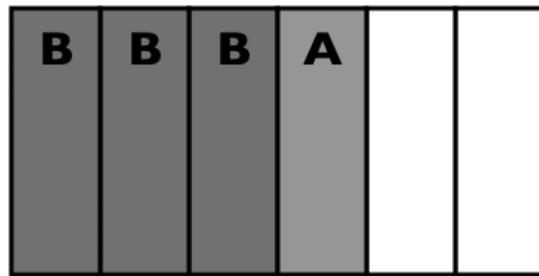
15. The figure to the right illustrates which of the following equations involving addition of rational numbers?

- (a)  $(3/4) + (1/6) = 11/12$       (b)  $(7/8) + (1/24) = 11/12$   
 (c)  $(2/3) + (1/4) = 11/12$       (d)  $(1/2) + (5/12) = 11/12$



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

16. The figure below is a model for which of the following choices?



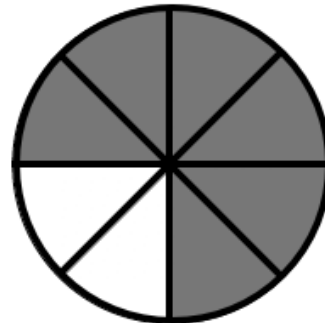
- (a)  $(1/2) \cdot (1/3) = 1/6$       (b)  $(1/3) \cdot (1/3) = 1/9$   
 (c)  $(1/2) + (1/6) = 2/3$       (d)  $(1/3) + (1/3) = 2/3$

17. 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  $2\frac{3}{4}$  is

- (a) 18      (b) 19       (c) 22      (d) 24

18. The figure to the right is a model for an equation involving division. What is the equation?

- (a)  $(3/4) \div (1/8) = 6$       (b)  $(1/8) \div (3/4) = 1/6$   
 (c)  $(3/8) \div (1/4) = 3/2$       (d)  $(8/3) \div (1/8) = 1/3$



19. What coins and bills would be best to illustrate addition and subtraction of whole numbers? You may assume that the numbers involved in the illustration, including the answers, are less than 100.

- (a) pennies, nickels, quarters, one dollar bills, and ten dollar bills  
 (b) pennies, dimes, one dollar bills, and ten dollar bills  
 (c) nickels, dimes, quarters, one dollar bills, and ten dollar bills  
 (d) pennies, nickels, fifty cent pieces, one dollar bills, and ten dollar bills

20. The number 0.0013 is equal to which of the following?

- (a) thirteen thousandths  
(b)  thirteen ten-thousandths  
(c) zero point one three  
(d) one hundredth and three ten-thousandths

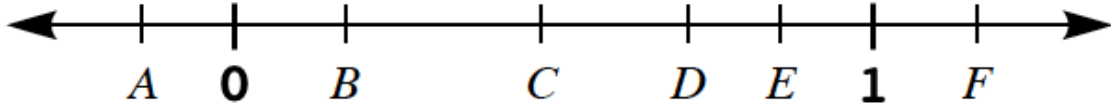
21. The number 1.0237 is equal to which of the following?

- (a)  $1 + \frac{2}{10} + \frac{3}{10^2} + \frac{7}{10^3}$   
(b)   $1 + \frac{2}{10^2} + \frac{3}{10^3} + \frac{7}{10^4}$   
(c)  $1 + \frac{2}{10^3} + \frac{3}{10^4} = \frac{7}{10^5}$   
(d)  $1 + \frac{2}{10^4} + \frac{3}{10^5} + \frac{7}{10^6}$

22. The fraction  $\frac{311207}{25}$  is equal to which of the following decimals?

- (a)  12448.28  
(b) 12464.75  
(c) 12468.25  
(d) 12488.48

23. Given the points as indicated on the number line below, what is the value of  $C \cdot D$ ?



- (a)  $A$   
(b)   $B$   
(c)  $E$   
(d)  $F$

24. Which of the following is a correct pair of inequalities?

- (a)  $0.339 < 0.34$  and  $-0.219 < -0.22$   
(b)  $0.339 > 0.34$  and  $-0.219 < -0.22$   
(c)   $0.339 < 0.34$  and  $-0.219 > -0.22$   
(d)  $0.339 > 0.34$  and  $-0.219 > -0.22$

25. Which one of the fractions below can be written as a terminating decimal?

- (a)  $\frac{13}{24}$   
(b)   $\frac{51}{96}$   
(c)  $\frac{12}{52}$   
(d)  $\frac{35}{75}$