

MAT 0012 Basic Algebra I

KEY CONCEPT REVIEW

CHAPTER 4, SECTIONS 4.1 – 4.4

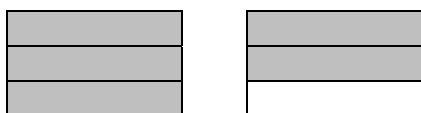
TO RECEIVE CREDIT, DO ALL PROBLEMS, MAKE CORRECTIONS, AND SHOW ALL WORK.

- 1) Identify the numerator and denominator:

$$\frac{5}{8}$$

- What does the denominator tell us?
- What does the numerator tell us?

Use the diagram below to answer Questions 2 and 3.



- Write a fraction to represent the area shaded.
- Which graph represents the area shaded?

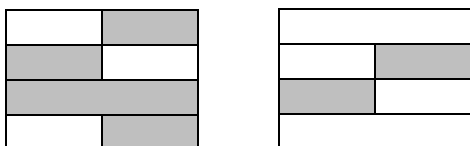
A)



B)



- What fraction of the area is not shaded? Write this fraction as an improper fraction and a mixed number.



- 5) Simplify each fraction.

a) $\frac{-9}{0}$

b) $\frac{0}{15}$

- 6) If a fraction simplifies to -1 , what can you conclude about its numerator and denominator?

- The numerator is -1 ; the denominator is 0 .
- The numerator and denominator are opposites.
- The numerator is 0 ; the denominator is -1 .
- The numerator and denominator are both negative.

- 7) Write each mixed number as an improper fraction.

a) $7\frac{3}{4}$

b) $-3\frac{1}{12}$

- 8) Write each improper fraction as a mixed number.

a) $-\frac{47}{5}$

b) $\frac{21}{4}$

- 9) Write the prime factorization of 396.

- $2^4 \cdot 11$
- $2^3 \cdot 3^2 \cdot 11$
- $3^4 \cdot 11$
- $2^2 \cdot 3^2 \cdot 11$

10) Write each fraction in simplest form.

a) $-\frac{39}{57}$ b) $\frac{42}{112}$

11) Which fractions below are not simplified?

A) $\frac{-4}{-11}$ B) $\frac{25}{9}$
 C) $\frac{51}{85}$ D) $\frac{7}{16}$

12) As part of his fitness training, Shane plans to cycle 72 miles in a week. So far, he has cycled 27 miles. What fraction of his training has he completed? Write this fraction in simplest form.

13) Simplify the fraction: $\frac{18xy}{45x^2}$

A) $\frac{2xy}{5}$ B) $\frac{27y}{x^2}$
 C) $\frac{2y}{5x}$ D) $\frac{2y}{5x^2}$

14) Which of these operations can be used to find "one-half of three fourths?"

A) $\frac{3}{4} \div \frac{1}{2}$ B) $\frac{3}{4} \div 2$
 C) $\frac{1}{2} \div \frac{3}{4}$ D) $\frac{1}{2} \cdot \frac{3}{4}$

Multiply and simplify.

15) $\left(\frac{16}{9}\right)\left(-\frac{3}{8}\right)$

16) $-\frac{2}{3} \cdot \frac{6y}{15}$

17) $-\frac{2}{5a} \cdot 30a^2$

Divide and simplify.

18) $\frac{7}{18} \div \left(-\frac{5}{9}\right)$

19) $-10 \div \left(-\frac{2}{5}\right)$

A) 4 B) -4
 C) 25 D) -25

20) $-\frac{8}{3} \div \frac{1}{6}$

Perform the indicated operations.

21) $\left(-\frac{1}{8}\right)\left(-\frac{3}{11}\right)\left(\frac{4}{33}\right)$

22) $\left(\frac{1}{5} \div \frac{1}{3}\right) \cdot \frac{5}{3}$

A) $\frac{9}{25}$ B) $\frac{1}{9}$
 C) 1 D) $\frac{25}{9}$

23) Michelle has a student loan of \$18,000. If she has paid off $\frac{4}{5}$ of the loan, what amount does she still owe?

A) \$22,500 B) \$4500
 C) \$14,400 D) \$3600

Correct the mistake in the calculations shown below.

24) $\frac{3}{8} + \frac{7}{8} = \frac{10}{16}$

25) $\frac{5y}{7} + \frac{2}{7} = \frac{7y}{7} = y$

Add or subtract. If possible, simplify the result.

26) $-\frac{4}{9} + \left(-\frac{8}{9}\right)$

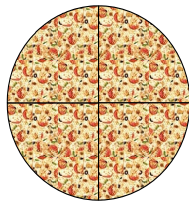
27) $-\frac{5}{6} - \left(-\frac{1}{6}\right)$

- | | |
|-------|-------------------|
| A) 1 | B) $\frac{4}{6}$ |
| C) -1 | D) $-\frac{2}{3}$ |

28) $\frac{12x}{15} - \frac{7x}{15} - \frac{8x}{15}$

29) $\frac{8a}{11} - \frac{7}{11}$

30) A pizza is cut into fourths as shown. If six people want to share this pizza equally, how should they slice it? What fractional amount will each one receive?



31) Which of these strategies can be used to find the least common denominator (LCD) of two fractions?

- A) Determine if the larger denominator is divisible by the smaller number.
- B) List the multiples of each denominator to find their smallest common multiple.
- C) Prime factor each denominator to find the factorization that contains the factors of each denominator.
- D) All of the above

Find the LCD of the given list of fractions:

32) $\frac{7}{20}, \frac{1}{6}, -\frac{2}{15}$

33) Write each fraction as an equivalent fraction with the given denominator.

a) $\frac{5}{12} = \frac{\quad}{108}$

b) $\frac{3s}{7} = \frac{\quad}{21}$