

Topics and Practice Problems for Arithmetic and Basic Skills (MARTH) Placement Test

General Information:

- Most of the problems on the test are multiple choice.
- The test is much shorter than this review. The Arithmetic and Basic Skills Placement test has about 30 problems and this review has more than 50 problems.
- There are a couple of fraction problems on the tests which require the answer to be submitted in a different manner. For those problems the numerator and denominator of the answer must be submitted in two separate boxes. For example if the answer is $\frac{5}{6}$ the 5 must be submitted in the first box and the 6 must be submitted in the second box .

Topics: Examples

1. Simplifying Fractions: Simplify the following fractions $\frac{12}{18}$ $\frac{35}{105}$

2. Converting between Improper Fractions and Mixed Numbers:

Change the following to Mixed or Whole Numbers.

$\frac{74}{8}$ $\frac{18}{6}$ $\frac{17}{4}$

Change the following to Improper Fractions.

$4\frac{3}{8}$ $8\frac{2}{9}$ 12

3. Multiplying Fractions and Mixed Numbers

$5\frac{1}{3} \times \frac{3}{4}$ $\frac{16}{35} \times \frac{14}{24}$
 $\frac{9}{10} \times \frac{5}{8}$ $3\frac{5}{6} \times 2\frac{2}{5}$

4. Dividing Fractions and Mixed Numbers

$\frac{7}{12} \div \frac{14}{15}$ $5\frac{3}{5} \div 2\frac{1}{10}$

$1\frac{3}{4}$
 $\frac{1\frac{3}{4}}{1\frac{3}{8}}$

5. Adding and Subtracting Fractions

$$\frac{7}{8} - \frac{2}{3}$$

$$\frac{1}{3} + \frac{1}{5} + \frac{1}{10}$$

$$\frac{3}{8} + \frac{5}{12} + \frac{7}{18}$$

6. Converting Fractions to Decimal Numbers

Convert the following to decimal numbers: $\frac{5}{16}$

$$\frac{27}{40}$$

7. Comparing Fractions

Which is the largest fraction in each set?

$$\frac{4}{15} \quad \frac{3}{10} \quad \frac{2}{5}$$

$$\frac{8}{9} \quad \frac{7}{3} \quad \frac{3}{2}$$

8. Evaluating Algebraic Expressions with Exponents

Let $a = -2$, $b = 5$, $c = -4$, and $d = 6$ and evaluate each of the expressions below.

$$3a^2 + 4c$$

$$\frac{2b-3d}{2a}$$

9. Solving a formula for an unknown variable.

Given $F = \frac{9}{5}C + 32$ if $F = 77$ then what is the value of C ?

Given $P = 2L + 2W$ if $P = 60$ and $W = 12$ then what is the value of L ?

10. Operations with Positive and Negative Numbers including Order of Operations

Evaluate each of the following:

$$-2^2 - (-3)^2$$

$$3 \times 2^2 + 4(-3)^2$$

$$-12 + (-7)(-5)$$

$$\frac{(-2)(-3) + (-7)(6)}{7-16}$$

11. Percent Problems

Calculating percentage from a table:

Consider the following table of student grades on a test. Answer each question to the nearest percent.

Exam Grade	Number of Students
A	4
B	10
C	12
D	3
F	2

- What percent of the students had an A on the exam?
- What percent of students had a B or better on the exam?
- What percent of the students had a grade lower than a C on the exam?

Percent word problems:

- The population of a town increases 4.2% in one year. If the original population was 19,500, what is the population after the increase?
- Carolyn's salary is \$5,220 per month. If deductions average 24.6%, what is her take home pay?

12. Ration problems:

Approximately 15 out of 100 people in the United States workforce carpool to work. There are an estimated 320,000 people in the workforce of a given city. How many of these people are expected to be in carpools?

13. Solving Linear equations:

- a. $6x - 5 = 3x + 13$
- b. $\frac{3}{4}x - 2 = 7$
- c. $3x - 15 = 7x - 10$

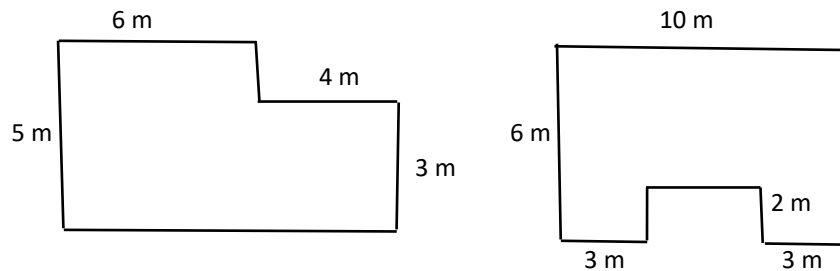
14. Solving proportions:

a. $\frac{55}{88} = \frac{10}{x}$

15. Decimal Number operations:

- a. You made charges of \$37.25, \$8.78, and \$53.45 on a credit card. If you made a payment of \$73.50, how much will you still owe?
- b. The thicknesses (in millimeters) of several parts are as follows: 30.9, 30.7, 29, 30.6, 29.3, 31.2, and 29.3. Calculate the mean to the nearest hundredth.

16. Find both the perimeter and the area of the figures shown. (measurements in meters)



17. Creating a formula or equation from a written description:

- a. Four hundred tickets were sold for a school play. General admission tickets were \$4 while student tickets were \$3. If the total ticket sales were \$1350, how many of each type of ticket are sold?
 - i. First create a single variable equation for this problem with x representing the number of general admission tickets sold.
 - ii. Find the number of general admission and student tickets sold.

- b. Beth bought 40¢ stamps and 15¢ stamps at the post office. If she purchased 60 stamps at a cost of \$19, how many of each kind of stamp did she buy?
 - i. Create a single variable equation for this problem.

 - ii. Solve for the quantity of each type of stamp purchased.

18. Unit price problem:

Which of these prices is the lowest cost per ounce? (1 lb. = 16 oz.)

- a. 12 oz. for \$5.00
- b. 18 oz. for \$6.88
- c. 1 lb. 12 oz. for \$10.16
- d. 2 lb. 8 oz. for \$15.04

19. Adding or subtracting polynomials:

- a. $(3x^2 + 2x - 4) + (2x^2 - 5x + 3)$
- b. $(3x^2 + 2x - 4) - (2x^2 - 5x + 3)$

20. Multiplying Polynomials:

- a. $5ab(3a^2b - 2ab + 4ab^2)$
- b. $(x + 3y)(4x - 5y)$