

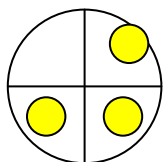
# Arithmetic Study Guide for the ACCUPLACER Assessment Test

## Fractions

### Terms

*Numerator:* which tells how many parts you have (the number on top)  $\rightarrow \frac{3}{4}$   
*Denominator:* which tells how many parts in the whole (the number on the bottom)  $\rightarrow \frac{3}{4}$

Example:



$$= \frac{3}{4} \text{ is 3 parts have a dot out of 4}$$

*Proper fraction:* the top number is less than the bottom number.

Ex:  $\frac{1}{3}, \frac{7}{10}, \frac{9}{19}$

*Improper fraction:* the top number is equal to or is larger than the bottom number.

Ex:  $\frac{3}{2}, \frac{9}{4}, \frac{8}{8}$

*Mixed Number:* a whole number is written next to a proper fraction.

Ex:  $1\frac{3}{4}, 2\frac{2}{5}, 10\frac{1}{2}$

*Common Denominator:* is a number that can be divided evenly by all of the denominators in the problem

Ex:  $\frac{3}{4} \rightarrow 12 \rightarrow \frac{9}{12}$   
 $\frac{2}{3} \rightarrow 12 \rightarrow \frac{8}{12}$   
 $\frac{1}{2} \rightarrow 12 \rightarrow \frac{6}{12}$

The common denominator for these fractions will be 12. It also happens to be least common denominator.

**Step 1:** Find a number that goes evenly into the numerator and the denominator of the fraction. With the fraction to the left, the number that will go in evenly is 8.

### Reducing Fract

Example:

$\frac{48}{64} \div \frac{8}{8} = \frac{6}{8}$  **Step 2:** Check to see whether another number goes evenly into both the numerator and denominator. Stop when there are no more numbers that can go into the fraction.  
 In the example, the fraction can be reduced further by dividing it by 2.

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

**Changing Mixed** **Step 1:** Multiply the denominator by the whole number.

Example: Chan **Step 2:** Add the result to the numerator.

$$2 \times 4 = 8$$

**Step 3:** Place the total over the denominator.

$$8 + 3 = 11$$

$$\frac{11}{4}$$

## Adding and Subtracting Fractions With Different Bottom Numbers

Example 1:  $\frac{3}{4} + \frac{2}{3} = \square$

$$\frac{3}{4} \times \frac{3}{3} = \frac{9}{12}$$

**Step 1:** Need to find the common denominator for all fractions.

$$\frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$$

Example 2:  $\frac{3}{4} - \frac{3}{16} =$

$$\frac{3}{4} \times \frac{4}{4} = \frac{12}{16}$$

$$\frac{3}{16} \times \frac{1}{1} = \frac{3}{16}$$

$$\frac{9}{12} + \frac{8}{12} = \frac{17}{12} = 1\frac{5}{12}^*$$

**Step 2:** Then go ahead and add or subtract the fractions.

$$\frac{2}{3}$$

\*Remember to change improper fractions to a mixed number.

## Multiplying Fractions

$$\frac{3}{4} \times \frac{5}{6} = \frac{15}{24}$$

Multiply the numerators across. Then multiply the denominators across. Make sure the product is in lowest terms.

## Multiplying with Mixed Numbers

Example  $2\frac{2}{3} \times 1\frac{2}{5} = \square$

$$2\frac{2}{3} = \frac{8}{3}$$

**Step 1:** Change every mixed fraction to an improper fraction.

$$1\frac{2}{5} = \frac{7}{5}$$

**Step 2:** Then multiply across.

$$\frac{8}{3} \times \frac{7}{5} = \frac{56}{15} = 3\frac{11}{15}$$

**Step 3:** Then, change the improper fraction to a mixed number in lowest terms.

## Dividing Fractions

Example:  $\frac{1}{4} \div \frac{1}{2} = \square$

The fraction that is right of the division sign will need to be turned upside down by writing the numerator in the denominator and the denominator in the numerator. Then follow the rules for multiplying fractions.

$$\frac{1}{4} \div \frac{1}{2} = \frac{1}{4} \times \frac{2}{1} = \frac{2}{4} = \frac{1}{2}$$

Practice:

1. Change  $4\frac{1}{6}$  to an improper fraction.
2. Change  $\frac{42}{16}$  to a mixed number.

$$\begin{array}{r} 3. \ 5\frac{3}{5} \\ + 2\frac{2}{3} \\ \hline \end{array}$$

$$\begin{array}{r} 4. \ 5\frac{1}{2} \\ + 3\frac{2}{3} \\ \hline \end{array}$$

$$\begin{array}{r} 5. \ 9\frac{11}{13} \\ - 2\frac{1}{2} \\ \hline \end{array}$$

$$\begin{array}{r} 6. \ 10\frac{7}{8} \\ - 2\frac{3}{7} \\ \hline \end{array}$$

$$7. \ 3\frac{1}{7} \times \frac{5}{9} =$$

$$8. \ 3\frac{3}{7} \times 2\frac{7}{9} =$$

$$9. \ \frac{6}{11} \div 14 = \boxed{\phantom{00}}$$

$$10. \ 3\frac{4}{5} \div 5\frac{5}{6} = \boxed{\phantom{00}}$$



Answers: 1)  $\frac{25}{6}$    2)  $2\frac{5}{8}$    3)  $8\frac{4}{15}$    4)  $9\frac{1}{6}$    5)  $7\frac{9}{26}$   
 6)  $8\frac{25}{56}$    7)  $1\frac{47}{63}$    8)  $9\frac{11}{21}$    9)  $\frac{3}{77}$    10)  $\frac{114}{175}$

## DECIMALS

### Adding and Subtraction Decimals

Add:  $28.5 + 44.47 + 3075.6$

$$\begin{array}{r} 28.50 \\ 44.47 \\ + 3075.60 \\ \hline 3148.57 \end{array}$$

Step 1: Line up the decimal points.

Step 2: Then add or subtract.

Subtract:  $380.53 - 75$

$$\begin{array}{r} 380.53 \\ - 75.00 \\ \hline 305.53 \end{array}$$

### Multiplying Decimals

Multiply  $1.89 \times 5.03 = \underline{\hspace{2cm}}$

$$\begin{array}{r} 1.89 \\ \times 5.03 \\ \hline 567 \\ 94500 \\ \hline 9.5067 \end{array}$$

**Step 1:** Multiply the decimals as you would do with whole

**Step 2:** Then count the number of spaces of each factor being multiplied. Decimal places are the number of spaces to the right of the decimal point, There is 2 in the top factor and two in the bottom factor, so the decimal is placed 4 spaces from the right.

**Step 3:** Show the total number of places in your answer.

### Dividing a Decimal by a Whole Number

Example:

$$\begin{array}{r} .037 \\ 73 \overline{)2.701} \\ \underline{219} \\ 511 \\ \underline{511} \\ \bar{0} \end{array}$$

Place the decimal point directly above its position in the problem.

Then divide the same way as you divide whole numbers.

### Dividing a Decimal by a Decimal Number

Example:  $4.374 \div .03 = \underline{\hspace{2cm}}$

$$\begin{array}{r} .03 \overline{)4.374} \rightarrow 3 \overline{)437.4} \\ \rightarrow 2 \text{ spaces} \end{array}$$

Move the decimal point of the divisor (outside the bracket) as far right as you can go. Then move the decimal point in the dividend (inside the bracket) the same number of places as the divisor.

Place the decimal point directly above its position in the problem. Then divide the same way as divide whole numbers.

$$\begin{array}{r} 145 .8 \\ 3 \overline{)437 .4} \\ \underline{3} \\ 13 \\ \underline{12} \\ 17 \\ \underline{15} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

Practice:

1.  $18.1$   
 $\times .04$

2.  $.97$   
 $\times 5.6$

3.  $123 + 2.6 + 9.04 =$

4.  $83.0097 + 124.9 + 9.043 =$

5.  $.07 - .002 =$

6.  $96 - .3992 =$

7.  $4 \overline{)27.36}$

8.  $0.2601 \div 9$

9.  $7.055 \div 0.83$

10.  $2.03 \overline{)4.466}$

Answers: 1) 0.724 2) 5.432 3) 134.64 4) 216.9527 5) 0.068  
6) 95.6008 7) 6.84 8) 0.0289 9) 8.5 10) 2.2



### Finding What Percent One Number Is of Another

There are key words to remember that will help you solve the problem it is asking you.

The word 'of' in the sentence means to multiply.

The word 'is' means it is equal to.

Example: 9 is what percent of 45

$$\begin{array}{l} \downarrow \\ 9 = a \\ \frac{9}{45} = \frac{45a}{45} \end{array}$$

$$\begin{array}{l} \downarrow \\ (x) 45 \end{array}$$

The variable 'a' is being multiplied by 45.  
Need to divide by 45.

$$\frac{9}{45} = a$$

$$\frac{9}{45} \div \frac{9}{9} = a$$

$$\frac{1}{5} = a$$

$$0.20 = a$$

$$20\% = a$$

Therefore, 20% of 45 is 9.

### Finding a Number When a Percent of It is Given

Example: 20% of what number is 16?

↓

$$.2 \times a = 16$$

$$\frac{20}{100} a = 16$$

Change the percent to fraction form.

$$\frac{1}{5} a = \frac{16}{1}$$

$$5 \times \frac{1}{5} a = \frac{16}{1} \times 5$$

Need to multiply both sides of the equation by 5.

$$a = 16 \times 5$$

$$a = 80$$

Practice:

Write the following in percent form.

1. 0.12   2.  $\frac{6}{8}$    3.  $\frac{2}{5}$    4. 0.233   5. 1.15

6. What is 11% of \$3,000?

7. 60 is what percent of 12,000?

8. 28 is 40 % of what number?

Answers: 1) 12%   2) 75%   3) 40%   4) 23.3%   5) 115%   6) \$330 7) 0.5%   8) 70
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