



Center for Alternative Studies and Educational Testing

# ARITHMETIC STUDY GUIDE

For the  
ACCUPLACER  
COMPUTERIZED PLACEMENT TEST  
and  
for achieving math proficiency.



The Testing Center has developed this new study guide to help students better prepare for the computerized placement tests. We value your feedback. If you have used this study guide, please take a moment to fill out the form on the last page of the guide and drop it off at either testing center. Comments and concerns will be used to improve the study guides and will be kept completely confidential.

## General CPT Information

The Board of Higher Education requires every student attending a post-secondary school in Massachusetts to demonstrate proficiency in the areas of math and communications before graduation. This may be done by attaining certain scores on CPT's (Computerized Placement Tests) or by completing required coursework.

The CPT's are comprised of three parts: reading comprehension, writing, and mathematics. All of these tests are done on the computer. The reading comprehension and mathematics sections contain multiple-choice questions and are not timed. The writing section requires that a student write an essay (approximately 300 words) in one 60-minute session. More information about each of these parts of the CPT may be found in the study guides.

### North Shore Community College uses CPT test results in two ways:

1. CPT Scores will determine whether a student has attained proficiency in math and communications. Most courses at NSCC require proficiency in one or both of these areas.
2. CPT scores will be used to determine a student's placement into the appropriate math and communication courses. Correct placement is essential for students to succeed in completing college-level work.

### What to Bring

Bring a photo ID (such as a valid driver's license or school ID with a photo) and your pink testing card (if you received one) from Enrollment. Calculators and dictionaries are not allowed. Scrap paper and pencils are provided. You will be asked to leave your belongings outside the testing room, so it is best not to bring anything of value with you when you come to test.

### Fees for Testing

There is no fee to take this test.

### Disability Accommodations and the Accuplacer Placement Test

With the exception of the writing sample, all of the tests are untimed so that most students with documented disabilities will not need to request special accommodations. Most of the time, testing takes place in small groups in a reduced distraction environment. Regardless of the disability, students are not allowed to use a calculator.

Students seeking extended time on Writeplacer or additional accommodations are required to request and be approved for those accommodations prior to their test date. Students wishing to request accommodations for the placement tests should contact the Disabilities Office on the campus they plan to attend - Danvers room DH101 x 4036 or in Lynn LW121 x 2132.

### Retest Policy

Because of the adaptive nature of CPT's, these tests are generally accurate in evaluating student competencies. Under unusual circumstances, a student will be allowed to retake one or more of the tests after a two-week waiting period. No student may take these tests more than twice per semester or enrollment period. For more information about the retest policy, please consult the test administrator before testing.

### Test Center Location and Testing Hours

Danvers Campus - DB213

Mon/Tue/Thur 8:30am - 7pm

Wed 8:30am - 8:30pm

Fri 8:30am - 4:30pm

Lynn Campus - LE232

Mon - Thur 8:30am - 7pm

Fri 8:30am - 4:30pm

\*\*\* No appointment is necessary to take the placement tests. To complete all of the placement tests required for new students, please allow 2 - 2.5 hours for testing. \*\*\*

## Arithmetic Placement Test

The arithmetic placement test is used for establishing mathematics proficiency and for placement into Fundamentals of Math (MAT011) through Elementary Algebra 1 (MAT091).

The 17 arithmetic questions administered by the CPT (ACCUPLACER™) Tests are divided into three types.

- Operations with whole numbers and fractions: topics included in this category are addition, subtraction, multiplication, division, recognizing equivalent fractions and mixed numbers, and estimating.
- Operations with decimals and percents: topics include addition, subtraction, multiplication, and division with decimals. Percent problems, recognition of decimals, fraction and percent equivalencies, and problems involving estimation are also given.
- Applications and problem solving: topics include rate, percent, and measurement problems, simple geometry problems and distribution of a quantity into its fractional parts.

Questions from all three categories are always presented to the student although the number of questions from each category varies with the student's skill level. For example, if the student's responses show minimal arithmetic skills, presenting too many applications problems is pointless. On the other hand, a student exhibiting good skills with whole numbers and fractions will be presented with more of these types of problems. Thus, the proportion of questions in the various categories will automatically vary according to the student's responses. In this sense, this test and the other ACCUPLACER™ Tests are truly adaptive in nature.

Calculators are NOT allowed while taking the Accuplacer test. You may use scrap paper. While working on this study guide, use scrap paper.

The arithmetic CPT test is untimed.

If you have difficulty understanding any of the concepts in the math study guides, go to one of the Tutoring Centers located in the Lynn or Danvers campuses. Hours are available by calling 978-762-4000. Additional Tutoring Center information can be found on the NSCC website at [www.northshore.edu/services/tutoring](http://www.northshore.edu/services/tutoring).

North Shore Community College also offers study guides specifically for Percents, Decimals, and Fractions.

Along with this guide we recommend the following websites that may be useful:

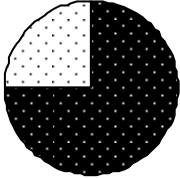
[www.collegeboard.com/student/testing/accuplacer](http://www.collegeboard.com/student/testing/accuplacer)  
[www.purplemath.com](http://www.purplemath.com)  
[www.math.com](http://www.math.com)

**TERMS YOU SHOULD BE FAMILIAR WITH:**

**Numerator:** the number on top (which tells how many parts you have)

**Denominator:** the number on the bottom (which tells how many parts are in the whole)

In the example below 3 (numerator) out of 4 (denominator) parts are shaded dark. This is represented by the fraction  $\frac{3}{4}$ .



**Proper fraction:** the top number (numerator) is less than the bottom number (denominator).

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

**Improper fraction:** the numerator is equal to or is larger than the denominator.

Examples:  $\frac{3}{2}$     $\frac{9}{4}$     $\frac{8}{8}$

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

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

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

Examples: Find the common denominator of  $\frac{3}{4}$  and  $\frac{2}{3}$  and  $\frac{1}{2} \rightarrow$

$$\frac{3}{4} = \frac{9}{12} \qquad \frac{2}{3} = \frac{8}{12} \qquad \frac{1}{2} = \frac{6}{12}$$

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

**Sum:** The result when two numbers are added.

**Difference:** The result when two numbers are subtracted.

**Product:** The result when two numbers are multiplied.

**Quotient:** The result when two numbers are divided.

**\*\* FRACTIONS \*\***

**REDUCING FRACTIONS TO LOWEST TERMS:**

STEP 1: Find a number that goes evenly into the numerator and the denominator of the fraction.

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.

Example:  $\frac{48}{64}$  (8 will go in evenly to both numbers)

$$\frac{48}{64} \div \frac{8}{8} = \frac{6}{8} \quad (2 \text{ will go in evenly to both numbers})$$

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

**CHANGING MIXED NUMBERS TO IMPROPER FRACTIONS:**

STEP 1: Multiply the denominator by the whole number.

STEP 2: Add the result to the numerator.

STEP 3: Place the total over the denominator.

Example:  $2\frac{3}{4} \rightarrow 4 \times 2 = 8 \rightarrow 8 + 3 = 11 \rightarrow \frac{11}{4}$

**ADDING AND SUBTRACTING FRACTIONS:**

In order to add or subtract fractions, the denominators must be equal (have a common denominator.)

Example:  $\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$

Example:  $\frac{3}{4} + \frac{1}{6} =$  (you must find a common denominator)

$$\frac{3}{4} \times \frac{3}{3} = \frac{9}{12} \quad \frac{1}{6} \times \frac{2}{2} = \frac{2}{12} \quad \rightarrow \quad \frac{9}{12} + \frac{2}{12} = \frac{11}{12}$$

**MULTIPLYING FRACTIONS:**

Step 1. Multiply the numerators across.

Step 2. Multiply the denominators across. (note: they do not need to be equal)

Step 3. Make sure the product is in its lowest terms.

Example:  $\frac{3}{4} \times \frac{5}{6} = \frac{15}{24}$  reduce to lowest terms  $\rightarrow \frac{5}{8}$

**MULTIPLYING WITH MIXED NUMBERS:**

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

Step 2: Multiply numerators across, then denominators across.

Step 3: Change the improper fraction to a mixed number in lowest terms.

Example:

$$2\frac{2}{3} \times 1\frac{2}{5} = \quad \rightarrow \quad \frac{8}{3} \times \frac{7}{5} = \frac{56}{15} \quad \rightarrow \quad 3\frac{11}{15}$$

**DIVIDING FRACTIONS:**

Step 1: The fraction that is to the right of the division sign will need to be turned upside down by writing the numerator in the denominator position and the denominator in the numerator position.

Step 2: Follow the rules for multiplying.

$$\text{Example: } \frac{1}{4} \div \frac{1}{2} \quad \rightarrow \quad \frac{1}{4} \times \frac{2}{1} \quad \rightarrow \quad = \frac{2}{4} \quad \text{reduce to lowest terms} = \frac{1}{2}$$

**\*\* DECIMALS \*\***

**TERMS:**

**Decimal number:** Any number that includes place value to the right of a decimal point.

**Decimal point:** A dot or point that separates the decimal value from the integral value of a number.

**ADDITION AND SUBTRACTION OF DECIMALS:**

Step 1: You must line up the decimal points in the problem. (Note: when the decimal points are lined up, the digits are automatically lined up in the correct place value.)

Step 2: Add or subtract.

Example:

$$28.5 + 44.47 + 3075.6 =$$

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

**MULTIPLYING DECIMALS:**

Step 1: Write the problem and multiply as you would a whole number multiplication problem.

Step 2: The product (answer) has the same number of decimal places after the decimal point as the total number of decimal places in the two numbers being multiplied.

Example:  $1.89 \times 5.03 =$  (note: there are 4 numbers to the right of the decimal point)

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

(place decimal point 4 spaces from the right)

**DIVIDING A DECIMAL BY A WHOLE NUMBER:**

Step 1: Place the decimal point above its position in the problem.

Step 2: Divide the same way as you divide whole numbers.

Example: divide 2.701 by 73

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

**DIVIDING A DECIMAL BY A DECIMAL NUMBER:**

Step 1: 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.

Step 2: Place the decimal point directly above its position in the problem. Then divide the same way as you would divide whole numbers.

In the example below the decimal point is moved 2 places to the right in both the divisor and the dividend.

Example:  $4.374 \div .03 =$

$$\begin{array}{r} .03 \overline{)4.374} \quad \rightarrow \quad 3 \overline{)437.4} \\ \underline{145.8} \\ 3 \overline{)437.4} \\ \underline{3} \\ 13 \\ \underline{12} \\ 17 \\ \underline{15} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

### Comparing Decimals:

Step 1: To compare decimals, write the decimal numbers with the same number of decimal places.

Step 2: Compare to see which is larger.

Example: Which is greater: 0.9 or 0.91?

0.90

0.91

0.91 is greater than 0.90

### \*\* PERCENTS \*\*

PERCENT: “PER” means “out of” or “divided by” and “CENT” means 100 (i.e. 100 cents in a dollar), therefore, PERCENT mean “out of 100” or “divided by 100.”

Percent is another way of writing fractions with a denominator of 100.

Percent refers to a value compared to a whole expressed as 100, rather than compared to a whole expressed as 1.

Percents are always expressed with a percent sign: %. 100% represents the whole amount, any value less than 100 is less than the whole, and any value greater than 100 is more than the whole.

Percents are used to describe a part of something. Percents are used to figure out sales or the amount of interest someone will pay on a loan. When converting a percent to its fraction form, it will always have a denominator of 100.

### CHANGING DECIMALS TO PERCENTS OR PERCENTS TO DECIMALS:

The important key is where to move the decimal point. If changing from decimal to a percent, you would need to move the decimal point two places to the right and add the percent sign.

Example: 0.35 = 35%  
0.8 = 80%

To change from percent to decimal, you need to move the decimal point two places to the left and drop the percent sign.

Example: 30% = .3  
0.9% = .009

### CONVERTING FRACTION TO PERCENT:

Divide the bottom number of the fraction (denominator) into the top number (numerator) and move the decimal point two places to the right.

$$\text{Example: } \frac{3}{4} \rightarrow 4 \overline{)3.00} \begin{array}{r} .75 \\ \underline{28} \\ 20 \\ \underline{20} \\ 0 \end{array} = .75 = 75\%$$

- or -

Multiply the fraction by 100%

$$\text{Example: } \frac{3}{4} \rightarrow \frac{3}{4} \times \frac{100\%}{1} = \frac{3}{1} \times \frac{25\%}{1} = \frac{75\%}{1} = 75\%$$

**CONVERTING PERCENT TO FRACTION:**

Write the percent as a fraction with 100 as the denominator. Then reduce the fraction to lowest terms.

$$\text{Example: } 85\% \rightarrow \frac{85}{100} \rightarrow \frac{85}{100} \div \frac{5}{5} = \frac{17}{20}$$

**FINDING A PERCENT OF A NUMBER:**

Translate the problem to mathematical symbols: “of” means multiply; “%” means per hundred (use decimal number.)

Example: What is 25% of \$6500.00

$$n = 25\% \times 6500$$

$$n = .25 \times 6500$$

$$n = \$1625$$

or another way to do this problem is to change the percent to a fraction:

$$n = \frac{25}{100} (6500) \rightarrow n = \frac{1}{4} (6500) \rightarrow n = \frac{6500}{4} \rightarrow$$

$$n = \$1625$$

**FINDING A PERCENT:**

What percent of 8 is 6?

$$n\% \times 8 = 6 \quad \text{Translate to mathematics. Note “is” means =.}$$

$$n\% \times \frac{8}{8} = \frac{6}{8} \quad \text{Using a fraction bar, divide both sides of equation by 8.}$$

$$n\% = \frac{6}{8} \quad \text{Dividing a number by itself equals one.}$$

$$n\% = \frac{3}{4} \quad \text{Reduce the fraction.}$$

$$n\% = 75\% \quad \text{Write the fraction as a percent.}$$

**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

$$\begin{array}{ccc} \downarrow & & \downarrow \\ 9 = a & & \times 45 \end{array}$$

The variable “a” is being multiplied by 45.

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

Need to divide by 45

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

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

$$\frac{1}{5} = a \quad \rightarrow \quad 0.20 = a \quad \rightarrow 20\% = a \quad \rightarrow \quad \text{Therefore, 20\% of 45 is 9.}$$

**FINDING A NUMBER WHEN A PERCENT OF IT IS GIVEN**

Step 1: Change the % to fraction form.

Example: 20% of what number is 16?

$$\begin{array}{c} \downarrow \\ .2 \times a = 16 \end{array}$$

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

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.

$$a = 16 \times 5$$

$$a = 80$$

## **SQUARE ROOT**

To square a number you multiply it by itself. For instance,  $2^2 = 2 \times 2 = 4$ ,  $3^2 = 3 \times 3 = 9$ . Finding the square root of a number is the inverse operation of squaring that number. The symbol for square-rooting is  $\sqrt{\quad}$ , the “radical” symbol.

Square of  $n = n^2$

Examples:

Square of 5 =  $5 \times 5 = 5^2 = 25$       thus  $\sqrt{25} = 5$

$2^2 = 4$ , so  $\sqrt{4} = 2$

$3^2 = 9$ , so  $\sqrt{9} = 3$

Example:  $\sqrt{9} + \sqrt{25} = 3 + 5 = 8$

## **MEAN (AVERAGE):**

The mean (average) is found by adding up all the numbers given and then dividing by the number of numbers.

Example: to find the average of four numbers: 9, 5, 20 and 13:

Add the four numbers:

$$9 + 5 + 20 + 13 = 47$$

Divide by the quantity of numbers (in this case four)

$$47 \div 4 = 11.75 \text{ average} = 11.75$$

**PROBLEMS FOR YOU TO TRY:**

1)  $3\frac{1}{2} + 4\frac{2}{3} =$

- A.  $\frac{5}{6}$       B.  $7\frac{3}{5}$       C.  $7\frac{5}{6}$       D.  $8\frac{1}{6}$

2)  $9 \times 4\frac{2}{3} =$

- A. 42      B.  $1\frac{13}{14}$       C.  $\frac{14}{27}$       D.  $36\frac{2}{3}$

3)  $3\frac{3}{5} \div 2\frac{1}{2} =$

- A.  $7\frac{1}{5}$       B. 9      C.  $1\frac{2}{3}$       D.  $1\frac{11}{25}$

4)  $3\frac{1}{3} - 2\frac{2}{5} =$

- A.  $1\frac{1}{2}$       B.  $\frac{1}{15}$       C.  $\frac{14}{15}$       D.  $1\frac{1}{15}$

5) An empty box weighs  $2\frac{1}{4}$  pounds. It is then filled with  $16\frac{2}{3}$  pounds of fruit. What is the weight of the box when it is full?

- A. 20 pounds      B.  $18\frac{11}{12}$  pounds      C. 22 pounds      D.  $18\frac{3}{8}$  pounds

6) A father leaves his money to his four children. The first received  $\frac{1}{3}$ , the second received  $\frac{1}{6}$ , and the third received  $\frac{2}{5}$ . How much did the remaining child receive? (Hint: think of the father's money as 1 whole.)

- A.  $\frac{1}{5}$  of the money      B.  $\frac{2}{10}$  of the money      C.  $\frac{1}{10}$  of the money      D.  $\frac{2}{5}$  of the money

7) Yanni is making formula for the baby. Each bottle contains  $6\frac{2}{5}$  scoops of formula. The formula container holds 320 scoops of formula. How many bottles of formula can Yanni make?

- A. 50 bottles      B. 60 bottles      C. 12 bottles      D. 100 bottles

8) Sam has a budget of \$45 to spend on entertainment for the weekend. If he spent  $\frac{1}{3}$  of his budget on Friday and  $\frac{2}{5}$  of his budget on Saturday, how many dollars does he have left over to spend on Sunday?

- A. \$12      B. \$33      C. \$9      D. \$36

9) Three people who work full-time are to work together on a project, but their total time on the project is to be equivalent to that of only one person working full-time. If one of the people is budgeted for one-half of his time to the project and a second person for one-third of her time, what part of the third worker's time should be budgeted to this project?

- A.  $\frac{1}{3}$       B.  $\frac{3}{5}$       C.  $\frac{1}{6}$       D.  $\frac{1}{8}$

10)  $2.75 + .003 + .158 =$

- A. 4.36      B. 2.911      C. 0.436      D. 2.938

11)  $7.86 \times 4.6 =$

- A. 36.156      B. 36.216      C. 351.56      D. 361.56

12) Which of the following is closest to  $27.8 \times 9.6$ ?

- A. 280      B. 300      C. 2800      D. 3000

13) At the beginning of the month, Jim's bank balance was \$275.38. During the month he wrote the following checks: \$174.89, \$68., and \$57.76. He made deposits of \$250. and \$350. Find his bank balance at the end of the month.

- A. \$586.21      B. \$604.00      C. \$574.73      D. \$524.73

14) The \$146.30 cost of a party was shared by 10 people. How much did each person have to pay?

- A. \$1.46      B. \$14.63      C. \$146.3      D. \$15.00

15) A car traveled at 65 miles per hour for a total of 390 miles? How many hours did the car travel?

- A. 7 hours      B. 39 hours      C. 25350 hours      D. 6 hours

16) A garden is 33.75 feet long and 21.6 feet wide. Draw a diagram of the garden with the lengths written on all four sides. What is the total distance around the garden?

- A. 110.7 inches      B. 67.5 inches      C. 43.2 feet      D. 110.7 feet

17) Which of the following is the least?

- A. 0.105      B. 0.501      C. 0.015      D. 0.15

18) The perimeter of a rectangle is 60 inches. If the width of the rectangle is 12 inches, then what is the length of the rectangle?

- A. 18 inches      B. 5 inches      C. 48 inches      D. 24 inches

19) What is 40% of 85?

- A. 21.25      B. 36      C. 34      D. 212.5

20) 15 is what percent of 60?

- A. 90%      B. 25%      C. 40%      D. 9%

21) John learned that after overhauling the carburetor in his car he would use only 80% as much gas. Last month, before overhauling his carburetor, he used 125 gallons of gas. Assuming that John drives the same number of miles next month, how many gallons of gas can he expect to save next month after overhauling his carburetor?

- A. 20      B. 25      C. 45      D. 100

22) Debra took a test that consisted of 150 questions and she got 78% correct. How many questions did Debra miss on the test?

- A. 28            B. 33            C. 24            D. 117

23) A survey of 250 people showed that 220 people favored a candidate for re-election. What percent of the people surveyed favored the candidate?

- A. 75%            B. 88%            C. 1.2%            D. 25%

24) 4% of 625 is what number?

- A. 60            B. 72            C. 156            D. 25

25) Mr. Smith, a professional wine tester, made \$32,800. last year. This year he had a raise of \$2132. What was the percent of the raise?

- A. 6.5%            B. 5.5%            C. 35%            D. 7.5%

26) All of the following are ways to write 25 percent of  $n$  EXCEPT:

- A.  $0.25n$             B.  $\frac{25n}{100}$             C.  $\frac{1}{4}n$             D.  $25n$

27) A soccer team played 160 games and won 65 percent of them. How many games did it win?

- A. 94            B. 104            C. 114            D. 124

28)  $\frac{7}{20} =$

- A. 0.035            B. 0.858            C. 0.35            D. 3.5

29)  $\sqrt{144}$

- A. 12.5            B. 12            C. 15            D. 15.5

30)  $\sqrt{100}$

- A. 50            B. 10            C. 100            D. 20

31) Find the average of the following numbers: 66, 21, 48, 50, 10

- A. 23.5            B. 39.25            C. 29            D. 39

## ANSWERS:

1. (D)  $3\frac{1}{2} + 4\frac{2}{3} = \frac{7}{2} + \frac{14}{3} = \frac{21}{6} + \frac{28}{6} = \frac{49}{6} = 8\frac{1}{6}$

2. (A)  $9 \times 4\frac{2}{3} = \frac{9}{1} \times \frac{14}{3} = \frac{126}{3} = 42$

3. (D)  $3\frac{3}{5} \div 2\frac{1}{2} = \frac{18}{5} \div \frac{5}{2} \rightarrow \frac{18}{5} \times \frac{2}{5} = \frac{36}{25} = 1\frac{11}{25}$

4. (C)  $3\frac{1}{3} - 2\frac{2}{5} = \frac{10}{3} - \frac{12}{5} = \frac{50}{15} - \frac{36}{15} = \frac{14}{15}$

5. (B)  $2\frac{1}{4} + 16\frac{2}{3} = \frac{9}{4} + \frac{50}{3} = \frac{27}{12} + \frac{200}{12} = \frac{227}{12} = 18\frac{11}{12} \text{ lbs.}$

6. (C)  $\frac{1}{3}, \frac{1}{6}, \frac{2}{5} \rightarrow$  find common denominator:  $\frac{10}{30}, \frac{5}{30}, \frac{12}{30}$  (think of the whole as  $\frac{30}{30}$ )

$\rightarrow$  subtract from whole:  $\frac{30}{30} - \frac{10}{30} - \frac{5}{30} - \frac{12}{30} = \frac{3}{30}$  reduce to lowest terms  $\frac{3}{30} = \frac{1}{10}$  of the money

7. (A)  $320 \div 6\frac{2}{5} \rightarrow \frac{320}{1} \div \frac{32}{5} = \rightarrow \frac{320}{1} \times \frac{5}{32} = \frac{1600}{32} = 50 \text{ bottles}$

8. (A)  $45 \times \frac{1}{3} = \frac{45}{3} = 15 \text{ Friday}$

$$45 \times \frac{2}{5} = \frac{90}{5} = 18 \text{ Saturday}$$

$$45 - 15 - 18 = \$12.00 \text{ remaining}$$

9. (C)  $\frac{1}{2} + \frac{1}{3} + x = 1 \rightarrow \frac{3}{6} + \frac{2}{6} + x = \frac{6}{6} (\text{whole}) \rightarrow \frac{5}{6} + x = \frac{6}{6}$

$$\frac{5}{6} + \frac{1}{6} = \frac{6}{6} \rightarrow \frac{1}{6} \text{ of the worker's time}$$

10. (B)

$$\begin{array}{r} 2.75 \\ .003 \\ \underline{.158} \\ 2.911 \end{array}$$

11. (A)  $7.86$  note: 2 decimal places  
 $X \ 4.6$  note: 1 decimal places  
 $\underline{4716}$   
 $+ \ 31440$   
 $\underline{36.156}$  note: decimal point is placed 3 places from the right

12. (A)  $27.8$   
 $X \ 9.6$   
 $\underline{1668}$   
 $+ \ 25020$   
 $\underline{266.88}$  note: decimal point is placed 2 places from the right  
 280 is the number nearest to 266.88

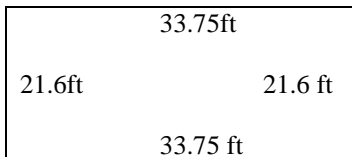
13. (C) Deposits = \$250. + \$350. = \$ 600.00  
 Withdrawals = \$174.89+ \$68.00 + \$57.76 = \$300.65  
 Balance + deposits – withdrawals = new balance  
 $\$ 275.38 + \$600.00 - \$300.65 = \$574.73$

14. (B)  $146.30 \div 10 =$   $\begin{array}{r} 14.63 \\ 10 \overline{)146.30} \\ \underline{10} \\ 46 \\ \underline{40} \\ 63 \\ \underline{60} \\ 30 \\ \underline{30} \\ 0 \end{array}$

Each person paid \$14.63

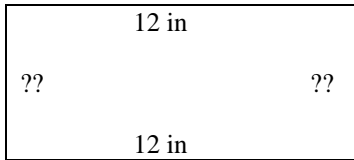
15. (D)  $390 \div 65 = 6$  hours  $\begin{array}{r} 6 \\ 65 \overline{)390} \\ \underline{390} \\ 0 \end{array}$

16. (D)  $33.75 \times 2 = 67.5$   
 $21.6 \times 2 = 43.2$   
 $67.5 + 43.2 = 110.70$  feet



17. (C)            0.105  
                       0.501  
                       0.015 (this is the least) note: write numbers with same # of decimal places  
                       0.150

18. (A)



Total perimeter = 60 inches

$$12 \times 2 = 24$$

$$60 - 24 = 36$$

$$36 \div 2 = 18 \text{ inches}$$

19. (C)         $85 \times .40 =$  (change % to decimal)

$$\begin{array}{r} 85 \\ \times .40 \\ \hline 34.00 \end{array}$$

20. (B)

$$15 = n\% \times 60$$

$$\frac{15}{60} = n\% \times \frac{60}{60}$$

$$\frac{1}{4} = n\%$$

$$25\% = n$$

21. (B)        125 gallons  $\times$  .80

$$\begin{array}{r} 125 \\ \times .80 \\ \hline 100.00 \end{array}$$

$$125 - 100 = 25 \text{ gallons of gas saved.}$$

22. (B)        150

$$\begin{array}{r} 150 \\ \times .78 \\ \hline 1200 \\ \underline{10500} \\ 117.00 \end{array}$$

$$150 - 117 = 33 \text{ missed}$$

23. (B)  $\frac{220 \text{ favored}}{250 \text{ whole}} \quad .88 = 88\%$

$$\begin{array}{r} .88 \\ 250 \overline{)220.00} \\ \underline{2000} \\ 2000 \\ \underline{2000} \\ 0 \end{array}$$

24. (D)  $4\% \times 625 = n$   $\begin{array}{r} 625 \\ \times .04 \\ \hline 25.00 \end{array}$

25. (A)  $32800 \times n\% = 2132$   
 $\frac{32800}{32800} \times n\% = \frac{2132}{32800}$   
 $n\% = .065$   
 $n\% = 6.5\%$

$$\begin{array}{r} .065 \\ 32800 \overline{)2132.000} \\ \underline{196800} \\ 164000 \\ \underline{164000} \\ 0 \end{array}$$

26. (D)  $25\% = .25 \text{ or } \frac{25}{100} = \frac{1}{4}$

27. (B)  $160 \times 65\% = n \quad \rightarrow \quad 160 \times .65 = n$

$$\begin{array}{r} 160 \\ \times .65 \\ \hline 800 \\ \underline{9600} \\ 104.00 \text{ games} \end{array}$$

28. (C)  $\frac{7}{20} \rightarrow$

$$\begin{array}{r} .35 \\ 20 \overline{)7.00} \\ \underline{60} \\ 100 \\ \underline{100} \\ 0 \end{array}$$

29. (B)  $12 \times 12 = 144 \rightarrow \sqrt{144} = 12$

30. (B)  $10 \times 10 = 100 \rightarrow \sqrt{100} = 10$

31. (D)  $66 + 21 + 48 + 50 + 10 = 195 \quad 195 \div 5 = 39$

(Note: divide by 5 because there are 5 numbers in the problem)

**Sources:**

North Shore Community College, Danvers, MA, Student Support Center study guides

AIMS Community College, Greeley, Colorado arithmetic study guide

Santa Fe Community College, Gainesville, FL arithmetic study guide

[www.collegeboard.com](http://www.collegeboard.com)

[www.purplemath.com](http://www.purplemath.com)

[www.math.com](http://www.math.com)

## STUDY GUIDE SURVEY

Thank you for using the NEW Arithmetic Study Guide. Your feedback is important to us and will assist us in improving study materials for students. Please fill out the form below and drop off at either testing center - Danvers room DB213, or Lynn room LE232. Thank you.

Please check all that apply:

- I am/will be a new student at North Shore Community College
- I am a NSCC returning student
- I am a student at another school but want to take a course that requires math proficiency
- Math proficiency is keeping me from graduating
- I am a faculty, staff member or tutor
- Other \_\_\_\_\_

Please indicate the approximate amount of time you spent reviewing this study guide:

- 30 minutes or less
- 30 minutes to 1 hour
- 1 - 2 hours
- 2 hours plus

Please indicate the highest level of math that completed in high school (or college- if applicable)?

\_\_\_\_\_

NSCC allows students to take a placement test twice per enrollment period.

Did you use this guide before taking the test for the first time?  Yes  No

Did you use this guide before taking the test for the second time?  Yes  No

Did your score improve?  Yes - by how many points? \_\_\_\_\_  No

Did you know that NSCC has tutoring centers on both campuses?  Yes  No

Did you use the tutoring center to help you prepare for this test?  Yes  No

Did anyone else help you prepare for this test (ie friend, family member)?  Yes  No

Did you find this study guide helpful?  Very helpful  Somewhat helpful  Not helpful

Please list the most helpful topics that were presented: \_\_\_\_\_

Please list the least helpful topics that were presented: \_\_\_\_\_

Would you recommend this study guide to a friend? \_\_\_\_\_

Comments/Suggestions:

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