H.C.C.T.P.

Highway Construction Careers Training Program
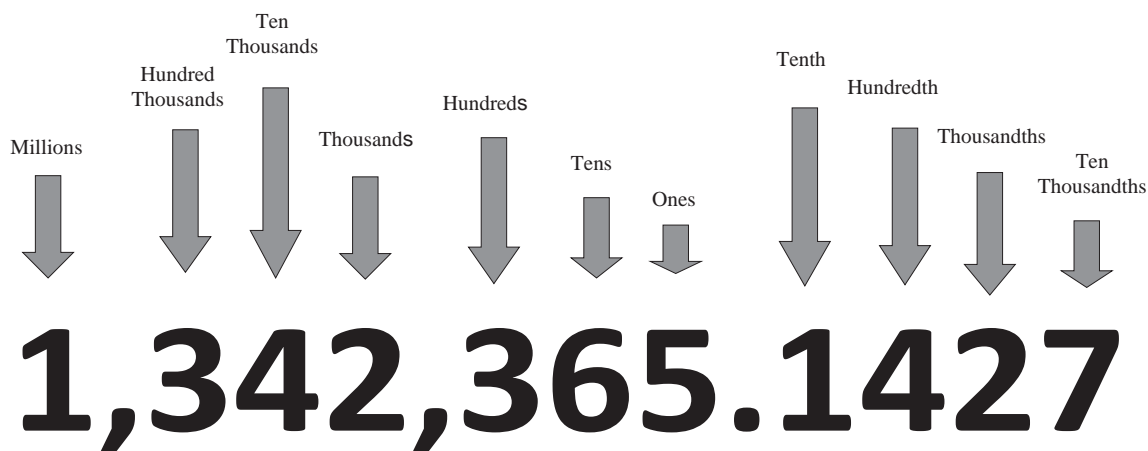
Entrance Exam

Study Guide

How to use this study guide:

*This study guide is to prepare you for the math section on your entrance exam. The majority of the basic information is listed below. The exam will use this basic information in various ways to test your problem solving skills and your computational skills. Within each section there are brief explanations and problems worked out. Throughout the packet you will see hints and tips marked with a **'careful'.** These 'careful' hints are to help you to avoid common mistakes.*

Good luck!

Rounding/Place Values:

The following represents the place value of individual digits.

Millions | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones | Tenth | Hundredth | Thousandths | Ten Thousandths

1,342,365.1427

Things to remember...the place value starts at 'ones' to the left of the decimal points and starts at: 'Tenths' to the right of the decimal point.

Steps for rounding:

1. Find the place value you are asked to round to.
2. Look to the digit to the right of the number.
3. If the digit is smaller than 5, leave your number alone.
   If the digit is greater than or equal to *5,* add one to your number.
4. All the numbers to the right of the digit become 0's.

Example:

17,721 rounded to the hundreds would be 17,700 because the 2 in the tens place is smaller than 5.
17,721 rounded to the thousands would be 18,000 because the 7 in the hundreds place is larger than 5.

Basic Operations: Whole Numbers

Addition: Line up your place values and add in columns. *Careful:* make sure to carry over correctly.

Example:

54,122 + 199

$$54\overset{11}{1}22$$
$$+\ 199$$
$$\overline{54321}$$

4,037 + 906

$$40\overset{1}{3}7$$
$$+906$$
$$\overline{4943}$$

Subtraction: Line up your place values and subtract in columns. *Careful:* make sure to borrow correctly.

Example:

3,891 – 462

$$\begin{array}{r} 3\,8\,9\,1 \\ -\;4\,6\,2 \\ \hline 3\,4\,2\,9 \end{array}$$

8,007 – 654

$$\begin{array}{r} 8\,0\,0\,7 \\ -\;6\,5\,4 \\ \hline 7\,3\,5\,3 \end{array}$$

Multiplication: Set up your problem in rows. Multiply the last digit in the bottom number with every number in the top. From there, multiply each subsequent digit in the bottom number with every number in the top. *Careful:* when you go from one digit to the next in the bottom number, make sure to add the correct number of 0's as place holders.

Example:

$$\begin{array}{r} 1589 \\ \times\,203 \\ \hline 4767 \\ 0000 \\ +\,317800 \\ \hline 322567 \end{array}$$

$$\begin{array}{r} 827 \\ \times\quad 64 \\ \hline 3308 \\ +49620 \\ \hline 52928 \end{array}$$

Division: Set up your problem in long division format. When given the problem as A ÷ B...the number B goes on the outside of the division symbol and the number A goes underneath the division symbol. Go step by step seeing how many times the divisor 'number on the outside' goes into the dividend 'number on the inside'.

Careful: Double check your multiplication and subtraction to avoid calculation mistakes.

Example:

1. 18,216 ÷ 792

$$\begin{array}{r} 23 \\ 792\overline{)18\,216} \\ -\,15\,84\downarrow \\ \hline 2\,37\,6 \\ -\,2\,37\,6 \\ \hline 0 \end{array}$$

2. 843 ÷ 13

$$\begin{array}{r} 64 \quad R\ 11 \\ 13\overline{)843} \\ -78 \\ \hline 63 \\ -\,52 \\ \hline 11 \end{array}$$

Division Steps

Does McDonalds Sell Cheese Burgers?

1.Divide

$$2\overline{)93}^{\,4}$$

2.Multiply

$$\begin{array}{r} 4 \\ 2\overline{)93} \\ 8 \end{array}$$

3.Subtract

$$\begin{array}{r} 4 \\ 2\overline{)93} \\ -8 \\ \hline 1 \end{array}$$

4.Compare

$$\begin{array}{r} 4 \\ 2\overline{)93} \\ -8 \\ \hline 1 \end{array}$$

5.Bring down

$$\begin{array}{r} 4 \\ 2\overline{)93} \\ -8\downarrow \\ \hline 13 \end{array}$$

Basic Operations: Decimals

Addition: First align the decimals in your numbers. Then add as you would with whole numbers.
Careful: Make sure your decimals are lined up.

Example:

1. 13.06 + 5.97

$$\begin{array}{r} 13.06 \\ +\;5.97 \\ \hline 19.03 \end{array}$$

2. 0.4 + 83 + 9.7

$$\begin{array}{r} 0.4 \\ 83 \\ +\;9.7 \\ \hline 93.1 \end{array}$$

2

Subtraction: First align the decimals in your numbers. Then subtract as you would with whole numbers.
Careful: Make sure your decimals are lined up.

Example:

56.09 − 22.4

$$\begin{array}{r} 5\overset{5}{\cancel{6}}.\overset{10}{\cancel{0}}9 \\ -\ 2\ 2.4 \\ \hline 3\ 3.69 \end{array}$$

87 − 34.17

$$\begin{array}{r} \overset{6}{\cancel{8}}\ \overset{9}{\cancel{7}}{}^{9} \\ -\ 3\ 4.17 \\ \hline 5\ 2.83 \end{array}$$

Multiplication: Multiply as you would whole numbers. The amount of numbers behind the decimal point in the problem, are the number of decimals in the answer. *Careful:* Do not align the decimals.

Example:

22.1 x 46

$$\begin{array}{r} \overset{1}{2}2.1 \\ \times\ \ 46 \\ \hline 1326 \\ +\ 8840 \\ \hline 1016.6 \end{array}$$

0.75 x 0.03

$$\begin{array}{r} \overset{1}{.}75 \\ \times\ .03 \\ \hline .0225 \end{array}$$

Division: Arrange the problem as long division. If there is a decimal in the divisor (number on the outside) move it to the right until the divisor is a whole number. The number of places the decimal was moved in the divisor is the number of places it should be moved in the dividend (number on the inside). *Careful:* Go slow and double check the multiplication and subtraction.

Example:

89.6 ÷ 5.6

$$\begin{array}{r} 1\,6. \\ 5.6\overline{)89.6.} \\ \underline{56} \\ 336 \\ \underline{-\ 336} \\ 0 \end{array}$$

2 ÷ 0.25

$$\begin{array}{r} 8. \\ 0.25\overline{)2.00.} \\ \underline{-\ 2\ 0\ 0} \\ 0 \end{array}$$

Mixed Numbers/Improper fractions: An improper fraction is where the numerator (number on top) is larger than the denominator (number on the bottom). A mixed number is a combination of a whole number and a common fraction.

Improper fraction: $^{13}/_2$

Mixed Number: $6\,^1/_2$

To change from improper fraction to a mixed number: Turn the fraction into a long division problem. How many whole times the denominator can go into the numerator is the whole number of the mixed number and any remainder is the numerator of the common fraction.

Example:
        Change $^{25}/_4$ to a mixed number.

$$\begin{array}{r} 6\ \ \text{R}\,1 \\ 4\overline{)25} \\ \underline{-\ 24} \\ 1 \end{array} = 6\frac{1}{4}$$

To change from a mixed number to an improper fraction: Multiply the denominator and the whole number, and then add the numerator. This new value is the numerator of the improper fraction.

Example: 4 x 2 = 8 + 3 = 11 $^{11}/_4$
        Change 2 ¾ to an improper fraction.

Reducing Fractions: To reduce a fraction, divide both the numerator and denominator by the same value.

Example:
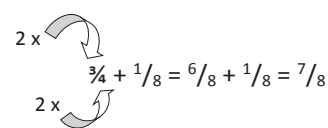
$^{24}/_9$ $$\frac{24 \quad \div 3}{9 \quad \div 3} = \frac{8}{3}$$ $^{36}/_{12}$ $$\frac{36 \quad \div 12}{12 \quad \div 12} = \frac{3}{1} = 3$$

Addition/Subtraction: When adding or subtracting fractions or mixed numbers, they need to have a common denominator, meaning the same denominator. If the numbers do not already have a common denominator, you will need to multiply one or both fractions by a value so that the fractions have a common denominator. **Careful:** When you change the fraction by multiplying the denominator, make sure you multiply the numerator as well.

Example:

1. $^7/_8 - {}^3/_8$ $\qquad$ $^7/_8 - {}^3/_8 = {}^4/_8 = ½$ $\qquad\qquad$ 2. $¾ + {}^1/_8$ $\qquad\qquad$ $¾ + {}^1/_8 = {}^6/_8 + {}^1/_8 = {}^7/_8$

3. $4\,{}^2/_3 + 2\,{}^5/_6$ $\qquad\qquad\qquad$ 4. $4\,{}^1/_8 - 3\,¾$

Multiplication: When multiplying improper or common fractions, you multiply the numerators and multiply the denominators. Try to reduce when possible. **Careful:** All mixed numbers must be changed to an improper fraction format prior to multiplication.

Example:
1. $^5/_6 \div {}^2/_3$ $\qquad\qquad\qquad\qquad\qquad\qquad$ 2. $5\,½ \div 2\,¼$

$$\frac{5}{6} \times \frac{3}{2} = \frac{5}{4}$$ $\qquad\qquad\qquad$ $$\frac{11}{2} \div \frac{9}{4} = \frac{11}{2} \times \frac{4}{9} = \frac{22}{9} = 2\frac{4}{9}$$

Negative Numbers

Addition:

Positive + Positive = Positive $\qquad\qquad$ Sum of a Negative and a Positive = Keep the sign of the larger and subtract
Negative + Negative = Negative

Example:

1. $3 + 7 = 10$ $\qquad\qquad$ 2. $-9 + (-2) = -11$ $\qquad\qquad$ 3. $-10 + 3 = -7$ $\qquad\qquad$ 4. $12 + (-5) = 7$

Subtraction:

Negative – Positive = Negative (Same as adding two negatives)

Positive – Negative = Positive (Same as adding two positives)

Negative – Negative = Negative + Positive (Keep the sign of the larger and subtract)

Example:

1. $-5 - 4 = -9$ $\qquad\qquad$ 2. $8 - (-7) = 15$ $\qquad\qquad$ 3. $-11 - (-14) = -11 + 14 = 3$ $\qquad\qquad$ 4. $-22 - (-3) = -22 + 3 = -19$

Multiplication/Division:

- Positive x/÷ Positive = Positive $\qquad$ • Negative x/÷ Negative = Positive $\qquad$ • Positive x/÷ Negative (or vice-versa) = Negative

Example:

$\qquad$ $3 \times 6 = 18$ $\qquad\qquad\qquad\qquad\qquad$ $-8 \times -3 = 24$ $\qquad\qquad\qquad\qquad\qquad$ $-12 \div 4 = -3$

Percent

Percent to a decimal: Divide the percent by 100.

Example:

$\qquad\qquad$ Change 32% to a decimal. $\qquad\qquad\qquad\qquad\qquad$ $32\% \div 100 = .32$

Decimal to a percent: Multiply the decimal by 100.

Example:

$\qquad\qquad$ Change 0.04 to a percent. $\qquad\qquad\qquad\qquad\qquad$ $0.04 \times 100 = 4\%$

<u>Percent to a fraction:</u> Change the percent to a decimal and then change to a fraction.

Example:

Change 16% to a fraction.

$$.16 = \frac{16^{\div 2}}{100_{\div 2}} = \frac{8^{\div 2}}{50_{\div 2}} = \frac{4}{25}$$

<u>Percent Proportion Problems:</u> The formula for solving percent proportion problems is the following.

$$\frac{part}{base} = \frac{percent}{100}$$

The percent is the value with a percent sign. The base value is the number after the word 'of' and the part value is the new partial value. To solve, cross multiply. Cross multiplication involves multiplying the two numeric values that are diagonally from each other, then dividing by the third number. **Careful:** Do not try and reduce diagonally.

Example:

What is 25% of 142?

$$\frac{x}{142} \diagdown\diagup \frac{25}{100}$$

100x = 3,550

÷100   ÷100

X = 35.5

What percent is 78 of 80?

$$\frac{78}{80} \diagdown\diagup \frac{\%}{100} = 97.5\%$$

35 is 72% of what number?

$$\frac{35}{x} = \frac{72}{100} \qquad \frac{72x}{72} = \frac{3,500}{72} \qquad x = 48.6$$

<u>Order of Operations</u>

The order of operations tells us in which order to evaluate a mathematical expression. The order is the following.

1. Parenthesis   2. Exponents   3. Multiplication/Division (left to right)   4. Addition/Subtraction (left to right

The saying to remember the order of operations is "Please Excuse My Dear Aunt Sally."

Careful: When multiplication and division are next to each other in the expression, evaluate from left to right...the same goes for addition and subtraction.

Example:

5 + (11 x 2 + 3) – 16   7 x 8 ÷ 2 x 3

5 + (22 + 3) - 16   56 ÷ 2 x 3

5 + (25) – 16   28 x 3
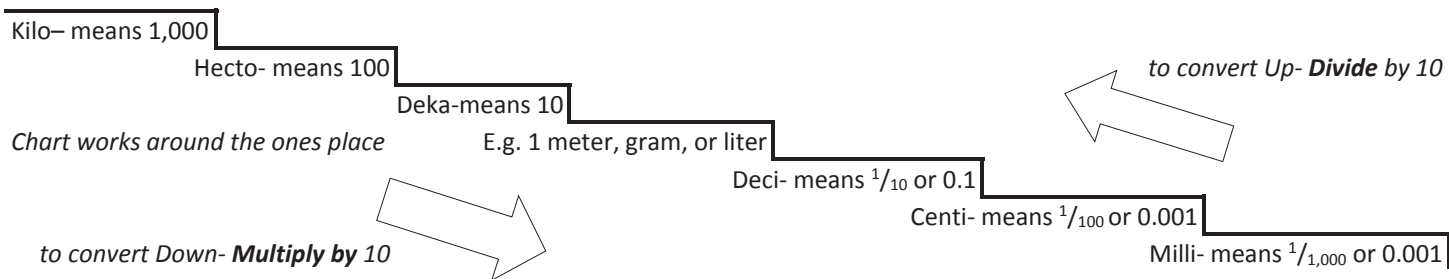
30 – 16   84

14

<u>Graphs</u>

There are several things to keep in mind when answering questions in relation to a graph.

– Review the entire graph before answering any questions.
– Pay close attention to the labels and increments of the horizontal and vertical axis.
– For questions that ask you to analyze the graph, read all the options first before making your final choice.

Conversions

Metric Conversions: Metric measurements are based on powers of 10.

Kilo– means 1,000

Hecto- means 100

Deka-means 10

Chart works around the ones place   E.g. 1 meter, gram, or liter

Deci- means $^1/_{10}$ or 0.1

Centi- means $^1/_{100}$ or 0.001

Milli- means $^1/_{1,000}$ or 0.001

*to convert Up- **Divide** by 10*

*to convert Down- **Multiply** by 10*

The saying to help remember metric conversions is "King Henry Died_____ Drinking Chocolate Milk" (The _____ is to help you remember the ones or units place).

Example:

Convert 350 mm to m.   Convert 1.7 km to m.

350   .35 m   1.700,   1700 *m*

US Conversions: Unlike the metric system, the US system has various conversion facts that are not based on power on powers of 10. There are several conversion facts/values that would be beneficial to memorize.

- 12 Inches = 1 foot   • 3 feet = 1 yard   • 16 ounces = 1 pound   • 60 seconds = 1 minute   • 60 minutes = 1 hour

When converting from a smaller unit to a larger unit, divide by the conversion value.

Example:
        Convert 21 ft. to yards.

$$\frac{21\ \cancel{ft}}{1} \times \frac{1\ yd}{3\ \cancel{ft}} = 7\ yd$$

When converting from a larger unit to a smaller unit, multiply by the conversion value.

Example:
        Convert 2.5 ft. to inches.

$$\frac{2.5\ \cancel{ft}}{1} \times \frac{12\ in}{1\ \cancel{ft}} = 30\,in$$

Plotting Points

Number Line: The values on a number line increase moving to the right and decrease moving to the left. Negative numbers are to the left of 0 and positive numbers are to the right of 0.

Coordinate Plane: The coordinate plane consists of two lines; one vertical (y-axis) and one horizontal (x-axis). The two axis meet at the point (0, 0) or the origin. The x-values are positive to the right of the origin and the y-values are positive about the origin.

To Plot a Point: Any point has the format (x, y) where x is the x-coordinate, the amount to move in the horizontal direction and y is the y-coordinate, the amount to move in the vertical direction. If the x-value is positive move right, if it is negative, move left. If the y-value is positive, move up. If the y-value is negative move down.

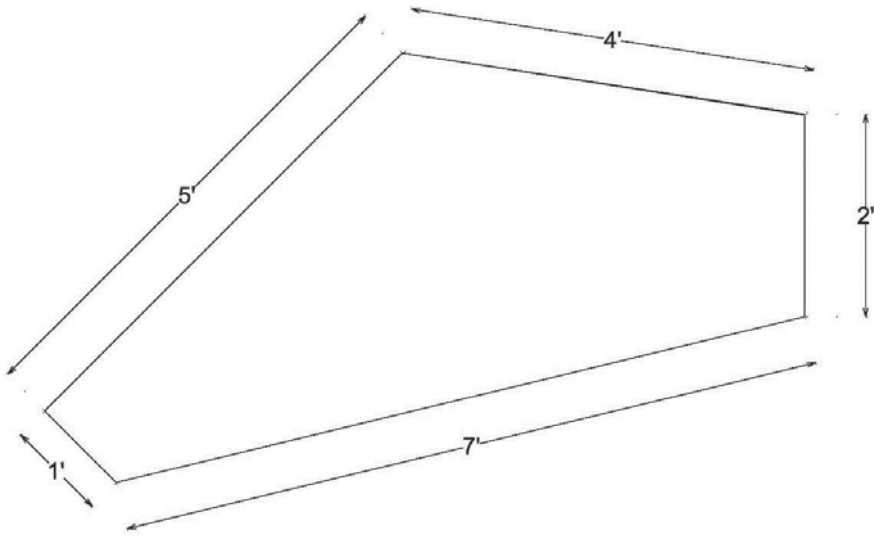Example: Plot the following points:

A (2, 5)   B (-2, 7)   C (-3, -4)   D (0, 5)

6
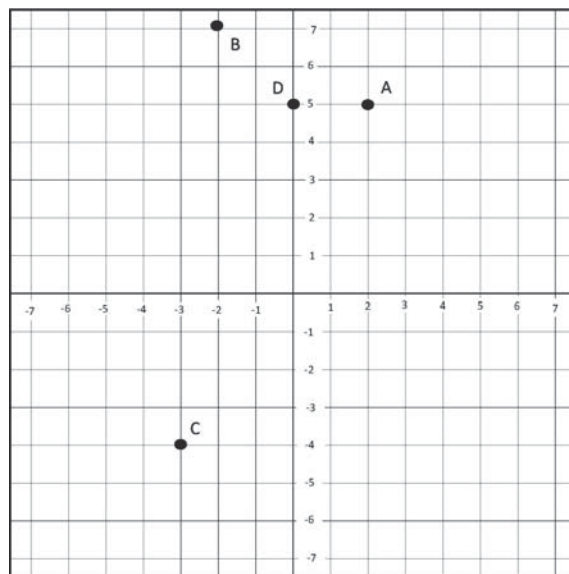
Geometric Figures

Perimeter: Perimeter is the length around a shape. To determine the perimeter of any shape, find the sum of the sides.

Example: What is the perimeter of the following figure?

$$1 + 5 + 4 + 2 + 7 = 19$$

Area: The two- dimensional space a figure occupies. There are several formulas that determine area, depending on the shape.
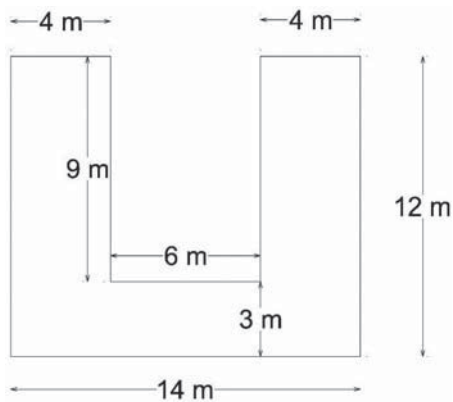
- Rectangle: length x width
- Triangle: ½ base x height
- Circle: π x radius

Example:

If the base of a triangle is 12 cm long and the height is 3 cm, what is the area of the triangle?

A = ½ (12) (3)
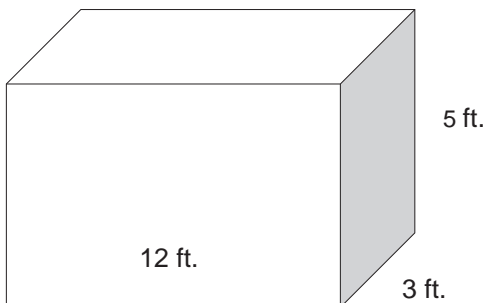
= 18 cm²

What is the area of the figure below?

$$4 \times 12 + 4 \times 12 + 6 \times 3 =$$
$$48 + 48 + 18 =$$
$$= 114 \, m^2$$

Volume: The three- dimensional space a figure occupies. To determine volume, multiply volume, multiply the area the base and the height of the figure.

Example:

What is the volume of the figure below?

V = 12' x 3' x 5'

= 180 ft.³

Practice Problems

WHOLE NUMBER PRACTICE

1. **Round to the given place**

A) 3,973 to hundreds   B) 253,678 to ten-thousands

2. **Add**

A) 68,421 + 985 + 6,711   B) 77 + 886 + 32,785 + 8

C) Find the difference between 7,042 and 6,134

3. **Multiply**

A) 7,024 x 352   B) 7,432 x 504

4. **Divide**

A) 30,572 ÷ 15   B) 98,521 ÷ 762

5. **Evaluate each expression using the order of operations.**

A) $3 + 5(6 - 1)$ B) $\dfrac{3(2+5)}{3^2+2}$ C) $7 - 2^3 \div 2 + 5$

6. **Applications**

A) Mr. Robinson drove from Los Angles to Chicago. He drove 420 miles on Monday, 365 miles on Tuesday, and 382 miles on Wednesday. If the total distance is 1,850 miles, how much further does he have to drive?

FRACTION PRACTICE

1. Reduce each fraction to lowest terms.   A) $^{21}/_{36}$ B) $^{14}/_{35}$ C) $^{9}/_{216}$

2. Write each improper fraction as a mixed number.   A) $^{21}/_{4}$ B) $^{49}/_{5}$ C) $^{106}/_{5}$

3. Write each mixed number as an improper fraction.   A) $5\,^{5}/_{7}$ B) $6\,¾$ C) $10\,^{3}/_{11}$

4. Add. Reduce your answers   A) $^{2}/_{5} + {}^{3}/_{8}$ B) $^{2}/_{3} + {}^{5}/_{16} + ¼$ C) $9\,^{2}/_{3} + 5\,^{5}/_{6}$

5. Subtract   A) $^{4}/_{9} - {}^{1}/_{8}$ B) $9 - {}^{11}/_{12}$ C) $11\,^{1}/_{5} - 6\,^{2}/_{3}$

6. Multiply. Reduce your answers.   A) $^{2}/_{5} \times {}^{3}/_{8}$ B) $^{1}/_{5} \times {}^{7}/_{8} \times {}^{5}/_{14}$ C) $9\,^{3}/_{7} \times 4\,^{2}/_{3}$

7. Divide. Reduce your answers.   A) $^{2}/_{3} \div {}^{6}/_{12}$ B) $5\,^{5}/_{8} \div 4$ C) $7\,^{3}/_{5} \div 4\,^{3}/_{10}$

8. Applications.

A) Fred Thomson a nurse worked $2\,^{2}/_{3}$ hours of overtime on Monday, 1 ¼ hours on Wednesday, $1\,^{1}/_{3}$ hours on Friday, and 6 ¾ hours on Saturday. If overtime pay is $22 per hour, what did Fred receive in overtime pay?

B) The parents of Harper Junior High School choir members are making robes for the choir. Each robe requires $2\,^{5}/_{8}$ yards of material at $8 per yard. How much will 24 choir robes cost?

C) A fifteen foot board is cut into 3 ½ foot long pieces for a bookcase. After as many pieces as possible are cut, how long is the remaining piece?

D) Gary Waller bought 27 ¾ acres to develop. He made a lake out of $17\,^{2}/_{3}$ acres, then set aside 1 ¾ acres for a park. How many $^{1}/_{3}$ acre lots can he sell from remaining acreage?

E) The number of box car loads shipped by one factory each day during the first week of February was 2 ½, 3 ¼, 2 ¾, 4, and $3\,^{3}/_{8}$. Determine the average number of box car loads shipped per day during this five-day period.

F) A container with 54 cups of flour had the following amounts removed: 2 ¼ cups, 3 ½ cups, 1 ¾ cups, 2 ½ cups, $3\,^{1}/_{3}$ cups, and $1\,^{2}/_{3}$ cups. How much flour remains in the container?

DECIMAL PRACTICE

1. Add or Subtract   A) 3.682 + 9.81 + 0.036   B) 87 + 1.042 + 19.876 + 8.6   C) 69.68 – 27.466   D) 39 – 18.46

2. Multiply   A) 0.074 x 0.81   B) 3.18 x 12   C) 89.11 x .0001

3. Divide   A) 35.4 ÷ 6   B) 3.8 ÷ 0.074 *(round to 2 decimal places)*   C) 0.52 ÷ 0.074 *(round to 2 decimal places)*

4. Write as a decimal. Round to two decimal places.   A) $^{1}/_{6}$ B) $^{2}/_{70}$ C) $8\,^{2}/_{3}$

5. Write as a fraction or mixed number.   A) 0.45   B) 0.025   C) 13.032

6. Applications

A) Nancy buys a shirt for $41.95 and a blouse for $29.95. How much change will she receive from four $20 bills?

B) Lynn had $43.91 in her checking account at the beginning of the month. During the month, she made deposits of $100 and $312.45. She wrote checks for $174.95, $114.25, $81.11, $30, and $9.50. What is her balance at the end of the month?

C) Lean ground round cost $3.29/lb. What will a package weighting 1.81 pounds cost to the nearest cent?

D) Eastern Phone Company charges $0.53 for the first minute and $0.29 for each additional minute for a phone call from Atlanta to Birmingham. How much would an 8-minute call cost?

E) The utility bills for an apartment for a six- month period were $162.50, $145.83, $ 179.72, $183.46, $171.60, and $184.09. Determine the average monthly billing for this period.

F) Multiply thirty- three and eight hundredths by forty and seven tenths, and round the product to the nearest tenth.

PERCENT PRACTICE

|			
1. **Write as a fraction.**	A) 6%	B) 40%	C) 560%
2. **Write as a decimal**	A) 56%	B) 3.29%	C) 560%
3. **Write as a percent.**	A) .6	B) 1.07	C) 1 ¼
4. **Solve the proportion.**	A) What is 10.7% of 485	B) 26% of 19.5 is what?	C) 5 is what percent of 2,000
	D) What percent of 12 is 24?	E) 4.8 is 15% of what?	F) 78% of what is 3.9?

5. Applications

A) If the interest rate on a charge card is 1 ¼ % on the unpaid balance and your unpaid balance this month is $312, how much interest will you pay this month?

B) If the baseball team wins 78 of the 114 games that it plays, what percent has it lost?

C) Jenkins Appliance has a washing machine regularly priced at $350 on sale for $297.50. What is the discount rate?

GEOMETRY PRACTICE

1. Find the perimeter of the following figures:

A)   B)   C)
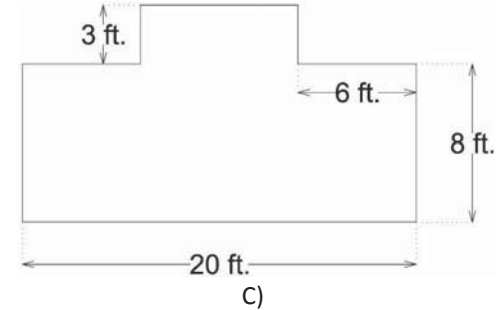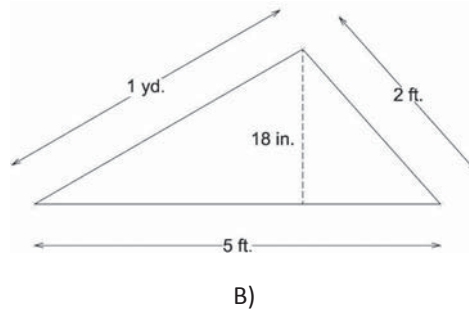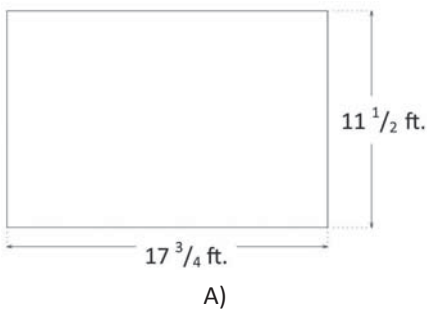
2. Find the area of the following figures.

A)   B)   C)
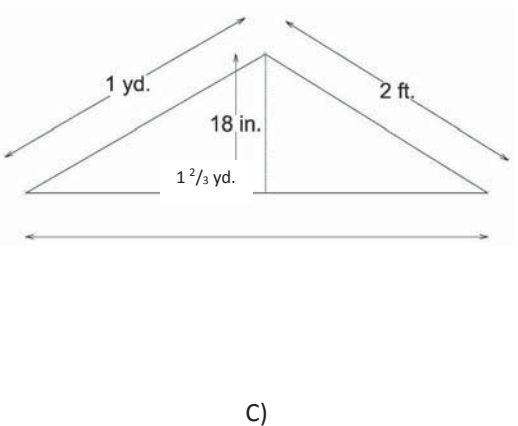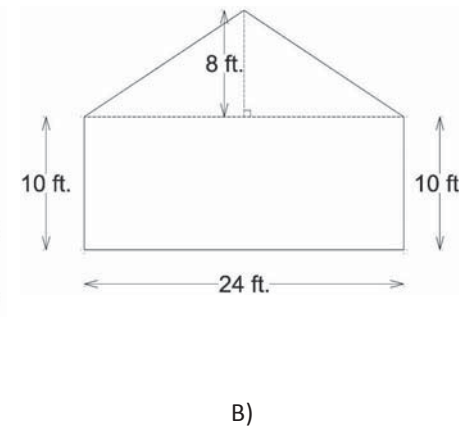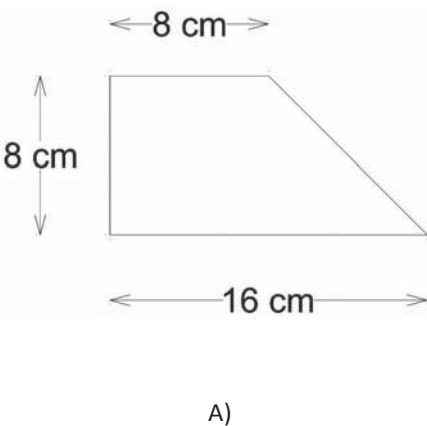
WHOLE NUMBER PRACTICE ANSWERS

1. A) 4,000   B) 250,000
2. A) 76,117   B) 33,756   C) 908
3. A) 2,472,448   B) 3,745,728
4. A) 2,038   R 2   B) 129   R 223
5. A) 28   B) $^{21}/_{11}$ or 1 $^{10}/_{11}$ or 1.90   C) 8
6. A) 683 miles

FRACTION PRACTICE ANSWERS

1. A) $^{7}/_{12}$ B) $^{2}/_{5}$ C) $^{1}/_{24}$
2. A) 5 ¼   B) 9 $^{4}/_{5}$ C) 21 $^{1}/_{5}$
3. A) $^{40}/_{7}$ B) $^{27}/_{4}$ C) $^{113}/_{11}$
4. A) $^{31}/_{40}$ B) $^{59}/_{48}$ or 1 $^{11}/_{48}$ C) $^{31}/_{2}$ or 15 ½
5. A) $^{23}/_{72}$ B) $^{97}/_{12}$ or 8 $^{1}/_{12}$ C) $^{68}/_{15}$ or 4 $^{8}/_{15}$
6. A) $^{3}/_{20}$ B) $^{1}/_{16}$ C) 44
7. A) $^{4}/_{3}$ or 1 $^{1}/_{3}$ B) $^{15}/_{32}$ or 1 $^{13}/_{32}$ C) $^{76}/_{43}$ or 1 $^{33}/_{43}$
8. A) $264   B) $504   C) 1 foot
    D) 25 lots   E) 3 $^{7}/_{40}$ box car loads per day   D) 39 cups

DECIMAL PRACTICE ANSWERS

1. A) 13.528   B) 116.518   C) 42.214   D) 20.54
2. A)   0.05994   B) 38.16   C)   0.008911
3. A) 5.9   B) 51.35   C) 7.03
4. A) 0.17   B) 0.03   C) 8.67
5. A) $^{9}/_{20}$ B) $^{1}/_{40}$ C) 13 $^{4}/_{125}$
6. A) $8.10   B) $46.55   C) $5.95   D) $2.56   E) $171.20   F) 1,346.4

PERCENT PRACTICE

1. A) $^{3}/_{50}$ B) $^{2}/_{5}$ C) $^{58}/_{5}$ or 5 $^{3}/_{5}$
2. A) .56   B) .0329   C) 5.60
3. A) 60 %   B) 107 %   C) 125 %
4. A) 51.895   B) 5.07   C) 0.25 %   D) 200 %   E) 32   F) 5
5. A) $3.90   B) 31.58 %   C) 15 %

GEOMETRY PRACTICE ANSWERS

1. A) 58 ½ ft.   B) 8 ft.   C) 62 ft.
2. A) 96 cm.^{2} B) 336 ft.^{2} C) 3 ¾ ft.^{2}

Reading

Read the following passage and then answer questions 1-6.

The splintered steps leading to the tenement's entrance were rotted and uneven. They led to an unlocked door which wobbled on its hinges and shrank from its frame. It creaked open to a dank, dark hall which smelled of urine and sweat. The paint was peeling off cracked walls. The faint yellow light hung low in the night.

Mr. and Mrs. Gomes lived on the second floor with their three young children. Their four-room apartment was immaculate and tidy. The kitchen floor glistened, and the flowered plates and glasses were neatly stacked in the drainer.

In the living room, the sheer curtains were always drawn back, filtering sunlight throughout the room, passing over a color television and several porcelain icons. Besides the freestanding gas heater was a brand name stereo system recently purchased on an "easy pay" credit plan.

The soft pine floors were all warped but recently painted. The wide floorboards, once loose in many places, were now nailed down securely. Clear plastic sheets were tacked over the windows to prevent heat loss.

The children, two girls and a boy, shared a large room with one small window that was separated from the kitchen by a curtain. The gas stove "warmed" them at night. Their toys were piled high in wooden crates. The children did not dare turn on the kitchen light for fear that the six-legged, brown-bodied pests would dart out in front of them.

The Gomes family had rented this apartment for ten years, ever since they came to this country. They had known no other home, although they had dreamed of many. Some day they hoped to live in a quiet neighborhood with open yards and spotless sidewalks, where people get into cars each weekday morning and commute to work.

1. You can infer that the story takes place in the
   a. summer
   b. spring
   c. fall
   d. winter
   e. none of the above

2. In the third paragraph the word icons means
   a. fine china plates
   b. ornate lamps
   c. religious figures
   d. ashtrays
   e. none of the above

3. You can conclude that the Gomes family members are
   a. native Americans
   b. United States citizens
   c. Chinese
   d. immigrants
   e. second generation Americans

4. What would be the opposite meaning of the word immaculate in the second paragraph?
   a. filthy
   b. girlish
   c. clean
   d. horrible
   e. modern

5. What can you infer about the children's bedroom?
   a. It is well furnished.
   b. It is crowded.
   c. It has its own bathroom.
   d. It is well lighted.
   e. It is pest-free.

6. The pests mentioned at the end of the passage are probably
   a. ants
   b. mice
   c. rats
   d. moths
   e. cockroaches

Read the following passage and choose the best answer for items 7 – 12.

What was Grandpa Tweedy Like?

Then there was Grandpa Tweedy, my daddy's daddy out in Banks County. He talked hard times morning, noon, and night. Called himself a farmer; but you never saw him behind a plow or driving a team. Like the lilies of the field in the Bible, he toiled not, neither did he spend his own money. He was always asking Papa to help him out. All he ever did was sit on the porch and swat flies, and like I said, even had him a pet hen to peck them up.

When Papa left the farm at sixteen to go work for Grandpa Blakeslee, he made twenty dollars a month and had to send half of it home to pay the field hand who took his place. That was the custom. But even after Papa married at nineteen, making forty dollars a month, he still had to send Grandpa Tweedy ten of it, till the day he was twenty-one. My mother never said she didn't like her father-in-law, but I could tell she didn't, and that may have been why.

What started me hating him, he wouldn't let me fish on Sunday. Said it was a sin. I remember I put out some set hooks late one Saturday, thinking if I caught a fish, it wouldn't be a sin to take him off the hook next morning. End his suffering, you know. Early Sunday I ran down to the river and one of the lines was just a jiggling! But when I ran up the hill and asked Grandpa's permission to get my fish off the hook he said, "Hit'll still be thar t'morrer, Lord willin'. The Lord ain't willin', it'll be gone. Now git in the house and study your catechism till time to leave for preachin'."

Of course the fish was gone Monday morning. But I got back at Grandpa Tweedy. I'd noticed a big hornet's nest in the privy, just under the tin roof, so I bided my time behind a tree till I saw him go in there. Giving him just long enough to get settled good, I let fly with a rock and hit that tin roof like a gunshot…

7. The statement "All he ever did was sit on the porch and swat flies" is a restatement of
   a. "he toiled not"
   b. "he talked of hard times"
   c. "called himself a farmer"
   d. "neither did he spend his own money"
   e. "even had him a pet hen to peck them up"

8. Which of the following actions would you expect Grandpa Tweedy to take?
   a. He would be the first man to fix anything that needed fixing.
   b. He would tend his lilies night and day just like in the Bible.
   c. He would talk for hours on end about his incredible good fortune.
   d. He would be glad to lend a helping hand to his children.
   e. He would let a fence fall down before he would repair it.

9. Which statement reflects the most likely reason that Papa sent money home to Grandpa Tweedy?
   a. Papa was paying back his father for money loaned to him for school.
   b. Children have a moral obligation to support parents who cannot support themselves.
   c. Papa felt guilty for having left the farm.
   d. Papa felt guilty for not having brought his wife back to the farm to live.
   e. Grandpa Tweedy did not like to spend his own money, so he asked Papa to help out.

10. What happened when the speaker told Grandpa Tweedy about the fish?
   a. Grandpa said it was a gift from God.
   b. Grandpa refused permission to take the fish off the hook.
   c. Grandpa said to wait until after preaching.
   d. Grandpa got angry at the speaker.
   e. Grandpa gave his permission to get the fish.

11. Which of the following is the best summary of what happened in the last paragraph?
   a. The speaker started hating Grandpa Tweedy.
   b. Grandpa threw a rock at the privy.
   c. The fish got away from the hook.
   d. The speaker stirred up the hornets while Grandpa was in the outhouse.
   e. The speaker set a trap for grandpa by hiding a hornet's nest in a tree.

12. How did the speaker justify taking the fish off the hook?
   a. The speaker planned to ask Grandpa's permission to get the fish off the hook.
   b. The speaker said that if it were done on Saturday, it would not be a sin.
   c. The speaker thought that it would be almost a good deed.
   d. The speaker told Grandpa that it was less work that way.
   e. The speaker planned to study the catechism as soon as the fish was off the hook.

Using the form provided and the conversation below, answer questions 13 – 18.

To: _____
Date: _____   Time: _____
WHILE YOU WERE OUT

M _____
Of _____
Phone Numbers:
Office   ○   Telephoned
Voicemail   ○   Please Call
FAX   ○   Returned your call
Pager   ○   Called to see you
Mobile   ○   Will call again
E-mail   ○   Urgent!
Message

_____

_____

_____

_____

_____

_____

Operator: _____

Ms. Wilson: Peabody Incorporated, Purchasing, May I help you?

Mr. Richards: This is Ralph Richards, of Widget Industries. I need to speak to Sam Waters.

Ms. Wilson: I'm sorry Mr. Waters is in a meeting. I'm Sara Wilson, his assistant, is there anything I can do for you, or may I take a message.

Mr. Richards: Kyle Kirby, my line manager, and Sam spoke yesterday over lunch, and your boss was interested in the aluminum alloy coated widgets we produce for Cramer Manufacturing. Sam wanted a price on 5 gross of #6 stainless steel widgets. If you could tell him that the price would be $365.82 tax and delivery included. There would be no extra charge for next day delivery either since we're just down the road. If he has any questions he can call me at 555-6210, extension 1101.

Ms. Wilson: Thank you, Mr. Richards. I'll see that he gets the message.

13. Whose name should be written on the top line of the form next to the word To?
    a. Sara Wilson
    b. Ralph Richards
    c. Sam Waters
    d. Kyle Kirby

14. Whose name should be written on the line next to the letter M?
    a. Sara Wilson
    b. Ralph Richards
    c. Sam Waters
    d. Kyle Kirby

15. What information need not be included in the message?
    a. Kyle Kirby is a line manager.
    b. 5 gross of widgets cost $365.82.
    c. No extra charge for next day delivery.
    d. Extension 1101

16. Which box would most likely be checked for this phone message?
    a. Urgent!
    b. Wants to see you
    c. Telephoned
    d. Returned your call

17. The second time Mr. Richards speaks he uses the word "interested," which of the following words has the opposite meaning?
    a. apathetic
    b. responsive
    c. concerned
    d. callous

18. The second time Mr. Richards speaks he uses the word "questions," which of the following words has the same meaning?
    a. interrogation
    b. inquiries
    c. assumptions
    d. ideas

Read the following poems and answer the corresponding questions.

Man on Wheels, by Karl Shapiro

Cars are wicked, poets think
Wrong as usual. Cars are part of man.
Cars are biological.
A man without a car is like a clam without a shell.
Granted, machinery is hell,
But carless man is careless and defenseless.
Ford is a skin of present animal.
Automobile is shell.
You get yourself a shell or else.

19. What is meant by the phrase, "Ford is skin of present animal?"
    a. There is a new animal living today called a Ford.
    b. Cars are as much a part of people's lives today as their own skin.
    c. People should buy Fords, not GM cars.
    d. Modern life is too full of machinery.
    e. If you cannot have a skin, you need a shell.

20. What is the poet's basic attitude toward cars?
    a. Cars are wicked.
    b. Cars and other machines are hell.
    c. Cars are a necessary part of modern life.
    d. Clams should drive cars.
    e. A man without a car does not have a care in the world.

Where the Wind Went Crazy, By Joyce Carol Oates

the tops of the palm trees are smashed
palm leaves hang, down shredded
limp and light as threads
the trunks like concrete
that never lived

mammoth towers
uninhabited

I feel the two of us grown to
mammoth towers
our heads dizzied by the height
time is piled beneath us
blocks pushing us up
there is motion of nerves between us
strung between us like wires

lovers, we need no hurricane
to make war upon each other
and each cell of our living tissue
is at peace

21. Why does the poet describe palm trees?
    a. She likes palm trees.
    b. She is comparing palm trees and telephone poles.
    c. She is comparing lovers to palm trees torn up by a hurricane.
    d. She is comparing palm trees to a hurricane.
    e. She is comparing palm trees to empty apartment buildings.

22. Which statement below best describes what the poet means by "there is motion of nerve between us strung between us like wires?"
    a. She feels like a palm tree.
    b. There is a sense of tension, like electricity, between the lovers.
    c. The hurricane makes her nervous.
    d. She feels like a tower.
    e. She is insane.

Answers to Reading

1. **d**. Because "clear plastic sheets were tacked over the windows to keep the heat in." Another clue is that the gas stove "warmed" the children at night.

2. **c**. One definition of an icon is a religious figure.

3. **d**. Reread the first sentence of the last paragraph.

4. **a**. Immaculate means very clean.

5. **b**. Choice "a" is incorrect because wooden crates are use to store toys. No mention is made of a bathroom, and one small window does not light a large room.

6. **e**. "Six-legged, brown-bodied pests" describes cockroaches.

7. **a**. Grandpa never worked (toiled), answers b and c suggested he worked, d is a different idea, e is a detail that describes sitting on the porch.

8. **e**. He would let the fence fall down before he would repair it, refers to his laziness, a is unlikely, there is no support for b, c, and d are wrong they indicate the opposite.

9. **e**. This answer is suggested by the information in the first paragraph. A is wrong, there is no evidence Grandpa Tweedy loaned money, there is no evidence that he could support himself so b is wrong, c and d might be right but e is the most likely answer.

10. **b**. Grandpa Tweedy refused permission, a and d are not what he said, c is contradictory and there is no evidence for e.

11. **d**. The rock was thrown by the speaker to stir up the hornets, a refers to the previous paragraph, b and e are misreadings, and c simply gives a reason for the speaker's actions.

12. **c**. Preventing the suffering of an animal would be a good deed, a and b would not be an excuse but do form the basis of option c, and there is no evidence for d and e.

13. **c**. The message is for (To) Sam Waters.

14. **b**. The message is from Mr.Ralph Richards.

15. **a**. The information that Kyle Kirby is a line manager is not important to the message.

16. **c**. This message was the result of a telephone call, it was not urgent, Mr. Richards did not call for an appointment, nor was he returning a call from Mr. Waters.

17. **a**. Apathy is defined as lack of interest or feeling.

18. **b**. A synonym for question is inquiry.

19. **b**. This is supported by the previous lines. Ford here stands for all cars, and the "present animal" is man.

20. **c**. The last five lines of the poem explain what it is like to be without a car.

21. **c**. She is comparing lovers and palm trees. The first half of the poem describes the palms, and the second half the lovers; the last four lines draw the connection.

22. **b**. The wires suggest electricity, and the tension is suggested by nerves.