Fraction Operations

Hints/Guide:

When adding and subtracting fractions, we need to be sure that each fraction has the same denominator, then add or subtract the numerators together. For example:

$$\frac{1}{8}+\frac{3}{4}=\frac{1}{8}+\frac{6}{8}=\frac{1+6}{8}=\frac{7}{8}$$

That was easy because it was easy to see what the new denominator should be, but what about if it is not so apparent? For example: $\frac{7}{12}+\frac{8}{15}$

For this example we must find the Lowest Common Denominator (LCM) for the two denominators. 12 and 15

12 = 12, 24, 36, 48, 60, 72, 84, ...
15 = 15, 30, 45, 60, 75, 90, 105, ...
LCM (12, 15) = 60

So, $\frac{7}{12}+\frac{8}{15}=\frac{35}{60}+\frac{32}{60}=\frac{35+32}{60}=\frac{67}{60}=1\frac{7}{60}$ Note: Be sure answers are in lowest terms

To multiply fractions, we multiply the numerators together and the denominators together, and then simplify the product. To divide fractions, we find the reciprocal of the second fraction (flip the numerator and the denominator) and then multiply the two together. For example:

$$\frac{2}{3}\bullet\frac{1}{4}=\frac{2}{12}=\frac{1}{6} \text{ and } \frac{2}{3}\div\frac{3}{4}=\frac{2}{3}\bullet\frac{4}{3}=\frac{8}{9}$$

Exercises: Perform the indicated operation: No calculators!
SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $\frac{6}{7}+\frac{2}{3}=$

2. $\frac{8}{9}+\frac{3}{4}=$

3. $\frac{9}{11}-\frac{2}{5}=$

4. $\frac{5}{7}-\frac{5}{9}=$

5. $\frac{6}{11}\bullet\frac{2}{3}=$

6. $\frac{7}{9}\bullet\frac{3}{5}=$

7. $\frac{6}{7}\div\frac{1}{5}=$

8. $\frac{7}{11}\div\frac{3}{5}=$

9. $\left[\frac{2}{3}-\frac{5}{9}\right]\div\left[\frac{4}{7}+\frac{1}{6}\right]=$

10. $\frac{3}{4}+\frac{4}{5}\left(\frac{5}{9}+\frac{9}{11}\right)=$

11. $\left[\frac{3}{4}+\frac{4}{5}\right]\left[\frac{5}{9}+\frac{9}{11}\right]=$

Decimal Operations

Hints/Guide:

When adding and subtracting decimals, the key is to line up the decimals above each other, add zeros so all of the numbers have the same place value length, then use the same rules as adding and subtracting whole numbers, with the answer having a decimal point in line with the problem. For example:

$$34.5 + 6.72 + 9.045 = \begin{array}{r} 34.5 \\ 6.72 \\ \underline{+\ 9.045} \end{array} = \begin{array}{r} 34.500 \\ 6.720 \\ \underline{+\ 9.045} \\ 50.265 \end{array} \qquad \text{AND} \qquad 5 - 3.25 = \begin{array}{r} 5.00 \\ \underline{-\ 3.25} \\ 1.75 \end{array}$$

To multiply decimals, the rules are the same as with multiplying whole numbers, until the product is determined and the decimal point must be located. The decimal point is placed the same number of digits in from the right of the product as the number of decimal place values in the numbers being multiplied. For example:

> 8.54 x 17.2, since 854 x 172 = 146888, then we count the number of decimal places in the numbers being multiplied, which is three, so the final product is 146.888 (the decimal point comes three places in from the right).

To divide decimals by a whole number, the process of division is the same, but the decimal point is brought straight up from the dividend into the quotient. For example:

$$\begin{array}{r} 17.02 \\ 3\overline{)51.06} \end{array}$$

The decimal point moves straight up from the dividend to the quotient.

Exercises: Solve: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. 15.709 + 2.34 + 105.06 =
2. 64.038 + 164.18 + 1005.7 =
3. 87.4 - 56.09 =
4. 500.908 - 4.72 =
5. 6108.09 - 2004.704 =
6. 9055.3 - 242.007 =

7. $\begin{array}{r} 63 \\ \underline{\text{x}\ .04} \end{array}$

8. $\begin{array}{r} .87 \\ \underline{\text{x}\ .23} \end{array}$

9. $\begin{array}{r} 8.904 \\ \underline{\text{x}\ \ 2.1} \end{array}$

10. $\begin{array}{r} 4.2 \\ \underline{\text{x}\ .602} \end{array}$

11. $35\overline{)70.35}$

12. $14\overline{)50.512}$

13. $23\overline{)74.888}$

Rename Fractions, Percents, and Decimals

Hints/Guide:

To convert fractions into decimals, we start with a fraction, such as $\frac{3}{5}$, and divide the numerator (the top number of a fraction) by the denominator (the bottom number of a fraction). So:

$$\begin{array}{r} 6 \\ 5\ |\ \overline{3.0} \\ \underline{-\ \ 30} \\ 0 \end{array} \qquad \text{and the fraction } \frac{3}{5} \text{ is equivalent to the decimal } 0.6$$

To convert a decimal to a percent, we multiply the decimal by 100 (percent means a ratio of a number compared to 100). A short-cut is sometimes used of moving the decimal point two places to the right (which is equivalent to multiplying a decimal by 100, so 0.6 x 100 = 60 and $\frac{3}{5} = 0.6 = 60\%$

To convert a percent to a decimal, we divide the percent by 100, 60% ÷ 100 = 0.6 so 60% = 0.6

To convert a fraction into a percent, we can use a proportion to solve,

$$\frac{3}{5} = \frac{x}{100}, \text{ so } 5x = 300 \text{ which means that } x = 60 = 60\%$$

Exercises: Complete the chart:

	Fraction	Decimal	Percent
1		0.04	
2			125%
3	$\frac{2}{3}$		
4		1.7	
5			0.6%
6	$3\frac{1}{2}$		
7		0.9	
8			70%
9	$\frac{17}{25}$		
10		0.007	

Add Mixed Numbers

Hints/Guide:

When adding mixed numbers, we add the whole numbers and the fractions separately, then simplify the answer. For example:

$$\begin{array}{r} 4\frac{1}{3} = 4\frac{8}{24} \\ +\,2\frac{6}{8} = 2\frac{18}{24} \\ \hline 6\frac{26}{24} = 6 + 1\frac{2}{24} = 7\frac{2}{24} = 7\frac{1}{12} \end{array}$$

First, we convert the fractions to have the same denominator, then add the fractions and add the whole numbers. If needed, we then simplify the answer.

Exercises: Solve in lowest terms: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

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

2. $\begin{array}{r} 6\frac{17}{25} \\ +\,8\frac{4}{7} \\ \hline \end{array}$

3. $\begin{array}{r} 6\frac{2}{3} \\ +\,9\frac{7}{9} \\ \hline \end{array}$

4. $\begin{array}{r} 3\frac{4}{5} \\ +\,\frac{3}{11} \\ \hline \end{array}$

5. $\begin{array}{r} 4\frac{3}{7} \\ +\,2\frac{1}{2} \\ \hline \end{array}$

6. $\begin{array}{r} 3\frac{6}{7} \\ +\,3\frac{11}{15} \\ \hline \end{array}$

7. $\begin{array}{r} \frac{12}{13} \\ +\,6\frac{8}{21} \\ \hline \end{array}$

8. $\begin{array}{r} 2\frac{8}{15} \\ +\,6\frac{6}{7} \\ \hline \end{array}$

9. $\begin{array}{r} 13\frac{2}{3} \\ +\,9\frac{6}{7} \\ \hline \end{array}$

Subtract Mixed Numbers

Hints/Guide:

When subtracting mixed numbers, we subtract the whole numbers and the fractions separately, then simplify the answer. For example:

$$\begin{array}{rl} 7\frac{3}{4} & = 7\frac{18}{24} \\ -2\frac{15}{24} & = 2\frac{15}{24} \\ \hline & 5\frac{3}{24} = 5\frac{1}{8} \end{array}$$

First, we convert the fractions to have the same denominator, then subtract the fractions and subtract the whole numbers. If needed, we then simplify the answer.

Exercises: Solve in lowest terms: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $\begin{array}{r} 4\frac{1}{2} \\ -3\frac{5}{6} \\ \hline \end{array}$

2. $\begin{array}{r} 5\frac{5}{6} \\ -\frac{3}{8} \\ \hline \end{array}$

3. $\begin{array}{r} 8\frac{7}{9} \\ -4\frac{8}{11} \\ \hline \end{array}$

4. $\begin{array}{r} 8\frac{3}{10} \\ -6\frac{7}{9} \\ \hline \end{array}$

5. $\begin{array}{r} 9\frac{7}{15} \\ -2\frac{7}{12} \\ \hline \end{array}$

6. $\begin{array}{r} 12\frac{8}{9} \\ -7\frac{3}{4} \\ \hline \end{array}$

7. $\begin{array}{r} 4\frac{6}{7} \\ -\frac{1}{8} \\ \hline \end{array}$

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

9. $\begin{array}{r} 10\frac{3}{8} \\ -6\frac{4}{5} \\ \hline \end{array}$

Multiply Mixed Numbers

Hints/Guide:

To multiply mixed numbers, we first convert the mixed numbers into improper fractions. This is done by multiplying the denominator by the whole number part of the mixed number and then adding the numerator to this product, and this is the numerator of the improper fraction. The denominator of the improper fraction is the same as the denominator of the mixed number. For example:

$$3\frac{2}{5} \text{ leads to } 3 \bullet 5 + 2 = 17 \text{ so } 3\frac{2}{5} = \frac{17}{5}$$

Once the mixed numbers are converted into improper fractions, we multiply and simplify just as with regular fractions. For example:

$$5\frac{1}{5} \bullet 3\frac{1}{2} = \frac{26}{5} \bullet \frac{7}{2} = \frac{182}{10} = 18\frac{2}{10} = 18\frac{1}{5}$$

Exercises: Solve and place your answer in lowest terms: No Calculators!
SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $6\frac{2}{3} \bullet 7\frac{3}{7} =$

2. $3\frac{1}{3} \bullet 6\frac{4}{5} =$

3. $7\frac{1}{8} \bullet 6 =$

4. $4\frac{3}{4} \bullet 1\frac{1}{5} =$

5. $7 \bullet 4\frac{2}{3} =$

6. $4\frac{1}{3} \bullet \frac{8}{9} =$

7. $2\frac{2}{5} \bullet 4\frac{2}{7} =$

8. $5\frac{3}{4} \bullet 2\frac{2}{11} =$

9. $1\frac{2}{9} \bullet 4\frac{3}{5} =$

Divide Mixed Numbers

Hints/Guide:

To divide mixed numbers, we must first convert to improper fractions using the technique shown in multiplying mixed numbers. Once we have converted to improper fractions, the process is the same as dividing regular fractions. For example:

$$2\frac{1}{2} \div 3\frac{1}{3} = \frac{5}{2} \div \frac{10}{3} = \frac{5}{2} \bullet \frac{3}{10} = \frac{15}{20} = \frac{3}{4} \qquad 3\frac{1}{2} \div 8\frac{2}{3} = \frac{7}{2} \div \frac{26}{3} = \frac{7}{2} \bullet \frac{3}{26} = \frac{21}{52}$$

Exercises: Solve and place your answer in lowest terms: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $1\frac{1}{5} \div 4\frac{2}{5} =$
2. $4\frac{4}{7} \div \frac{4}{9} =$
3. $\frac{8}{9} \div 2\frac{3}{5} =$
4. $4\frac{1}{4} \div \frac{5}{7} =$
5. $3\frac{2}{3} \div 4\frac{3}{7} =$
6. $\frac{3}{4} \div 2\frac{3}{11} =$
7. $6\frac{1}{5} \div 8\frac{2}{5} =$
8. $8\frac{2}{7} \div 7\frac{8}{9} =$
9. $6\frac{4}{7} \div 3\frac{3}{5} =$

Find Percent of a Number

Hints/Guide:

To determine the percent of a number, we must first convert the percent into a decimal by dividing by 100 (which can be short-cut as moving the decimal point in the percentage two places to the left), then multiplying the decimal by the number. For example:

4.5% of 240 = 4.5% x 240 = 0.045 x 240 = 10.8

Exercises: Solve for n: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. 305% of 450 = n
2. 7.5% of 42 = n
3. 120% of 321 = n
4. 15% of 54 = n
5. 0.65% of 320 = n
6. 800% of 64 = n
7. 95% of 568 = n
8. 150% of 38 = n
9. 215% of 348 = n
10. 85% of 488 = n
11. 9.05% of 750 = n
12. 160% of 42 = n
13. 60% of 78 = n
14. 0.4% of 480 = n
15. 0.10% of 435 = n
16. 2.4% of 54 = n

Solve Problems using Percent

Hints/Guide:

When solving percent problems, we apply the rules for finding percent of a number in realistic situations. For example, to find the amount of sales tax on a $450.00 item if the tax rate is 5%, we find 5% of 450 (.05 x 450 = 22.5), and then label our answer in dollars, getting $22.50.

Exercises:

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. Susie has just bought a pair of jeans for $49.95, a sweater for $24.50, and a jacket for $85.95. The sales tax is 5%. What is her total bill?

2. Jack bought a set of golf clubs for $254.00 and received a rebate of 24%. How much was the rebate?

3. A construction manager calculates it will cost $2,894.50 for materials for her next project. She must add in 12.5% for scrap and extras. What will bill the total cost?

4. The regular price for a video game system is $164.50 but is on sale for 30% off. What is the amount of the discount?

   What is the sale price?

5. Cindy earns a 15% commission on all sales. On Saturday, she sold $985.40 worth of merchandise. What was the amount of commission she earned on Saturday?

6. The band had a fundraiser and sold $25,800 worth of candy. They received 38% of this amount for themselves. How much did they receive?

Integers I

Hints/Guide:

To add integers with the same sign (both positive or both negative), add their absolute values and use the same sign as the addends. To add integers of opposite signs, find the difference of their absolute values and then take the sign of the larger absolute value.

To subtract integers, add the opposite of the second addend. For example,

6 – 11 = 6 + -11 = -5

Exercises: Solve the following problems:

1. (-4) + (-5) =
2. -9 - (-2) =
3. 6 + (-9) =
4. (-6) - 7 =
5. 7 - (-9) =
6. 15 - 24 =
7. (-5) + (-8) =
8. -15 + 8 - 8 =
9. 14 + (-4) - 8 =
10. 14.5 - 29 =
11. -7 - 6.85 =
12. -8.4 - (-19.5) =
13. 29 - 16 + (-5) =
14. -15 + 8 - (-19.7) =
15. 45.6 - (-13.5) + (-14) =
16. -15.98 - 6.08 - 9 =
17. -7.24 + (-6.8) - 7.3 =
18. 29.45 - 56.009 - 78.2 =
19. 17.002 + (-7) - (-5.23) =
20. 45.9 - (-9.2) + 5 =

Integers II

Hints/Guide:

The rules for multiplying integers are:

Positive x Positive = Positive	Negative x Negative = Positive
Positive x Negative = Negative	Negative x Positive = Negative

The rules for dividing integers are the same as multiplying integers.

Exercises: Solve the following problems:

1. 4 • (-3) • 6 =

2. 5(-12) • (-4) =

3. (4)(-2)(-3) =

4. $\frac{(-5)(-6)}{-2} =$

5. $\frac{6(-4)}{8} =$

6. $\frac{-56}{2^3} =$

7. 6 (-5 - (-6)) =

8. 8 (-4 - 6) =

9. -6 (9 - 11) =

10. $\frac{-14}{2} + 7 =$

11. $8 - \frac{-15}{-3} =$

12. $-3 + \frac{-12 \bullet -5}{4} =$

13. $\frac{-6-(-8)}{-2} =$

14. $-7 + \frac{4+(-6)}{-2} =$

15. 45 - 14 (5 - (-3)) =

16. (-4 + 7) (-16 + 3) =

17. 16 - (-13) (-7 + 5) =

18. $\frac{4+(-6)-5-3}{-6+4} =$

19. $(-2)^3(-5-(-6)) =$

20. 13 (-9 + 17) + 24 =

Solving Equations I

Hints/Guide:

The key in equation solving is to isolate the variable, to get the letter by itself. In one-step equations, we merely undo the operation - addition is the opposite of subtraction and multiplication is the opposite of division. Remember the golden rule of equation solving: If we do something to one side of the equation, we must do the exact same thing to the other side. Examples:

1. $x + 5 = 6$
   $\underline{-5 \quad -5}$
   $x = 1$
   Check: $1 + 5 = 6$
   $6 = 6$
2. $t - 6 = 7$
   $\underline{+6 \quad +6}$
   $t = 13$
   Check: $13 - 6 = 7$
   $7 = 7$
3. $\frac{4x}{4} = \frac{16}{4}$
   $x = 4$
   Check: $4(4) = 16$
   $16 = 16$
4. $6 \cdot \frac{r}{6} = 12 \cdot 6$
   $r = 72$
   Check: $72 \div 6 = 12$
   $12 = 12$

Exercises: Solve the following problems: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $x + 8 = -13$
2. $t - (-9) = 4$
3. $-4t = -12$
4. $\frac{r}{4} = 24$
5. $y - 4 = -3$
6. $h + 8 = -5$
7. $\frac{p}{8} = -16$
8. $-5k = 20$
9. $-9 - p = 17$

Solving Equations II

Hints/Guide:

The key in equation solving is to isolate the variable, to get the letter by itself. In two-step equations, we must undo addition and subtraction first, then multiplication and division. Remember the golden rule of equation solving: If we do something to one side of the equation, we must do the exact same thing to the other side. Examples:

1. $4x - 6 = -14$

$+ 6 \quad + 6$

$\underline{4x} \quad = \underline{-8}$

$4 \qquad 4$

$x \quad = -2$

Solve: $4 (-2) - 6 = -14$

$-8 \quad - 6 = -14$

$-14 = -14$

2. $\frac{x}{-6} - 4 = -8$

$+ 4 \quad + 4$

$-6 \bullet \frac{x}{-6} = -4 \quad \bullet -6$

$x \ = \ 24$

Solve: $(24/-6) - 4 = -8$

$-4 \quad - 4 = -8$

$-8 = -8$

Exercises: Solve the following problems: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $-4t - 6 = 22$
2. $\frac{m}{-5} + 6 = -4$
3. $-4r + 5 = -25$
4. $\frac{x}{-3} + (-7) = 6$
5. $5g + (-3) = -12$
6. $\frac{y}{-2} + (-4) = 8$

Equations - Variables on Each Side

Hints/Guide:

As we know, the key in equation solving is to isolate the variable. In equations with variables on each side of the equation, we must combine the variables first by adding or subtracting the amount of one variable on each side of the equation to have a variable term on one side of the equation. Then, we must undo the addition and subtraction, then multiplication and division. Remember the golden rule of equation solving. Examples:

$8x - 6 = 4x + 5$	$5 - 6t = 24 + 4t$
$-4x \quad -4x$	$+6t \quad +6t$
$4x - 6 = 5$	$5 = 24 + 10t$
$+6 \quad +6$	$-24 \quad -24$
$\frac{4x}{4} = \frac{11}{4}$	$\frac{-19}{10} = \frac{10t}{10}$
$x = 2\frac{3}{4}$	$-1\frac{9}{10} = t$

Exercises: Solve the following problems: No Calculators!

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1. $4r - 7 = 8r + 13$
2. $14 + 3t = 5t - 12$
3. $4x + 5 = 3x - 3$
4. $6y + 5 = 4y - 13$
5. $5x - 8 = 6 - 2x$
6. $7p - 8 = -4p + 6$

Inequalities

Hints/Guide:

In solving inequalities, the solution process is very similar to solving equalities. The goal is still to isolate the variable, to get the letter by itself. However, the one difference between equations and inequalities is that when solving inequalities, when we multiply or divide by a negative number, we must change the direction of the inequality. Also, since an inequality as many solutions, we can represent the solution of an inequality by a set of numbers or by the numbers on a number line.

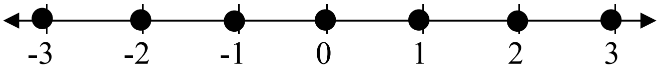
Inequality - a statement containing one of the following symbols:

$<$ is less than $>$ is greater than $\leq$ is less than or equal to

$\geq$ is greater than or equal to _ is not equal to

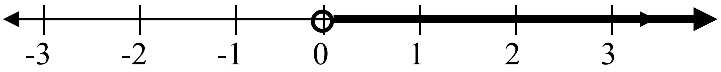
Examples:

1. Integers between -4 and 4.



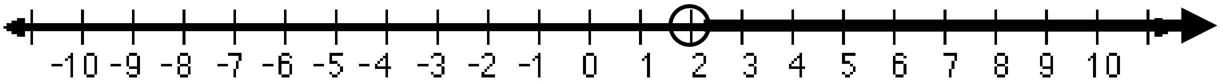
2. All numbers between -4 and 4.

3. The positive numbers.



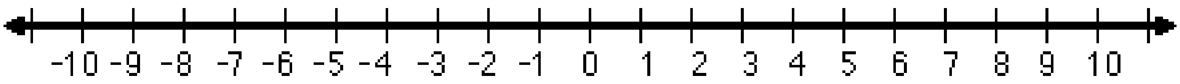
So, to solve the inequality -4x < -8 becomes $\frac{-4x}{-4} < \frac{-8}{-4}$

and therefore x > 2 is the solution (this is because whenever we multiply or divide an inequality by a negative number, the direction of the inequality must change) and can be represented as:

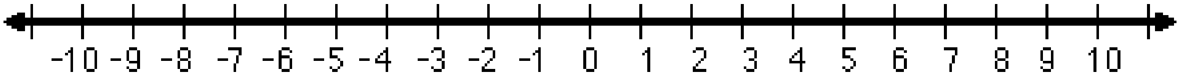


Exercises: Solve the following problems: No Calculators!

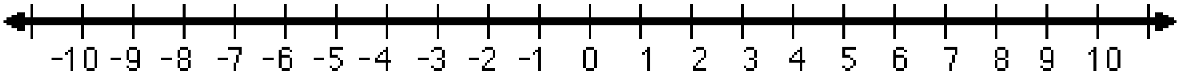
1. $4x > 9$



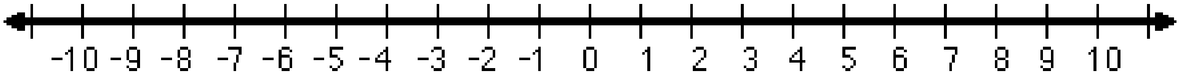
2. $-5t \geq -15$



3. $\frac{x}{2} \geq 3$



4. $\frac{x}{-4} > 2$

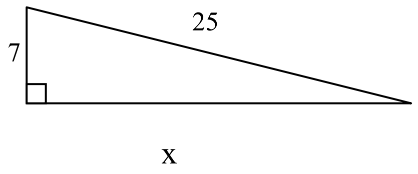


Pythagorean Theorem

Hints/Guide:

The Pythagorean Theorem states that in a right triangle, and only in a right triangle, the length of the longest side (the side opposite the right angle and called the hypotenuse, or c in the formula) squared is equal to the sum of the squares of the other two sides (the sides that meet to form the right angle called legs, or a and b in the formula). The formula is $a^2 + b^2 = c^2$.

Find the missing side.

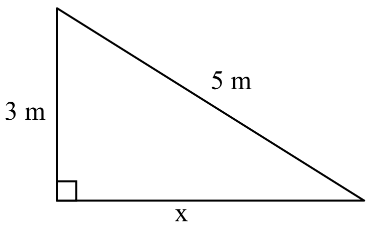


$$a^2 + b^2 = c^2$$
$$7^2 + x^2 = 25^2$$
$$49 + x^2 = 625$$
$$-49 \qquad -49$$
$$x^2 = 576$$
$$\sqrt{x^2} = \sqrt{576}$$
$$x = 24$$

Exercises: Solve for the variable:

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

1.



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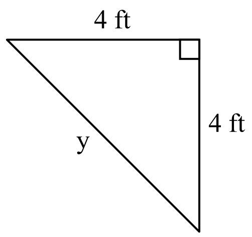

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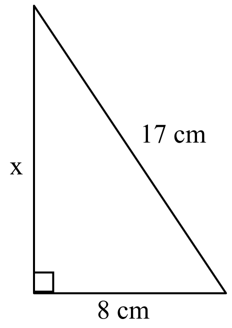

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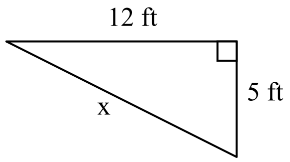

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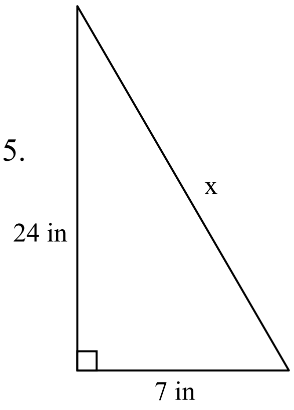

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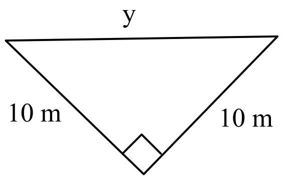

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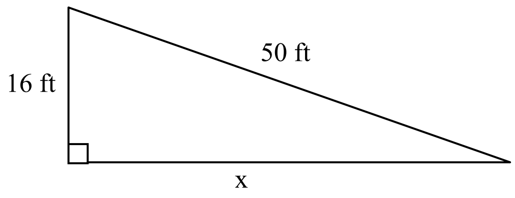

Volume

Hints/Guide:

To find the volume of prisms (a solid figure whose ends are parallel and the same size and shape and whose sides are parallelograms) and cylinders, we multiply the area of the base times the height of the figure. The formulas we need to know are:

The area of a circle is $A = \pi r^2$ The area of a rectangle is A = bh

The area of a triangle is $A = \frac{1}{2} b\, h$ The volume of a prism is

V = (Area of Base) • (Height)

So, the volume of a rectangular prism can be determined if we can find the area of the base and the perpendicular height of the figure.

Exercises: Find the volume of the following figures: Note: Use $\pi = 3.14$

SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

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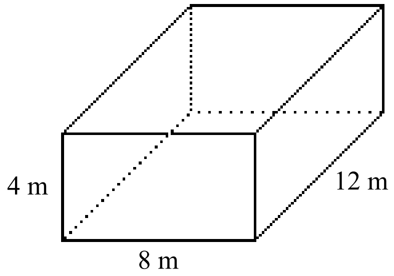

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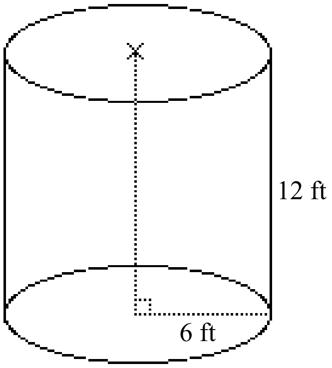

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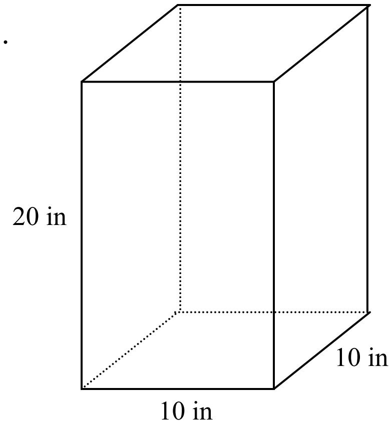

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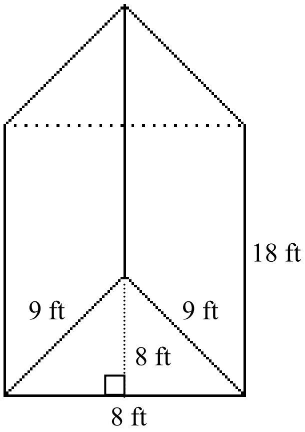
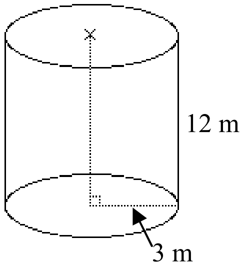


Surface Area

Hints/Guide:

To determine the surface area of an object, we must find the areas of each surface and add them together. For a rectangular prism, we find the area of each rectangle and then add them together. For a cylinder, we find the area of each base and then add the area of the rectangle (the circumference of the circular base times the height) which wraps around to create the sides of the cylinder. For example:



The area of each base is $A = \pi r^2 = 3.14 \cdot 3 \cdot 3 = 28.26\text{ m}^2$
and the area of the cylinder "wrap" is
$A = 2\pi rh$ (which is the circumference of the circle times the height of the cylinder)
$= 2 \cdot 3.14 \cdot 3 \cdot 12$
$= 226.08$
So the surface area is $28.26 + 28.26 + 226.08 = 282.6\text{ m}^2$

Exercises: Determine the surface area of the following figures:
SHOW ALL WORK. Use a separate sheet of paper (if necessary) and staple to this page.

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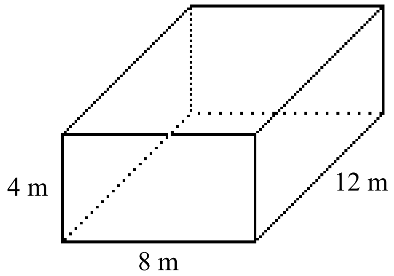

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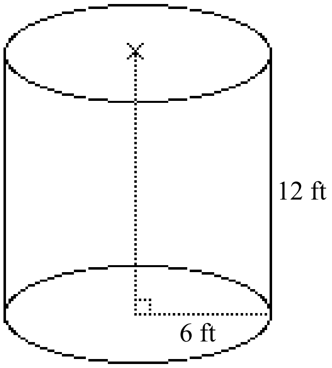

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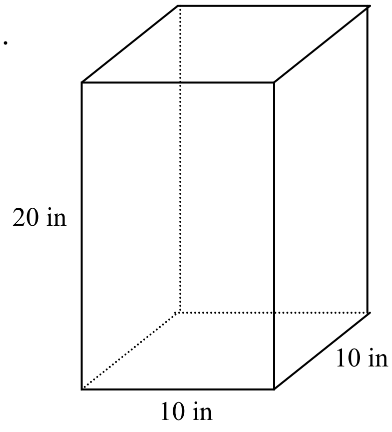

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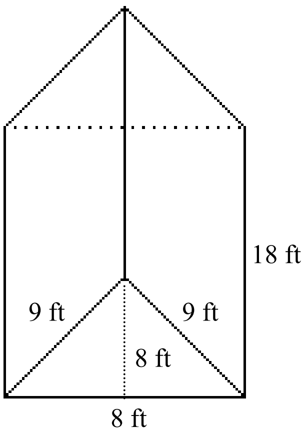


Geometry I

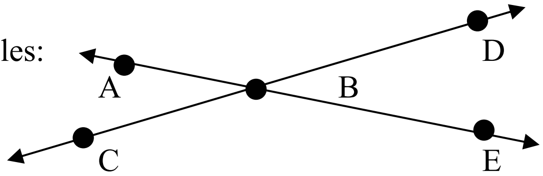
Hints/Guide:

In order to learn geometry, we first must understand so geometric terms:

Right Angle - an angle that measures 90 degrees.
Acute Angle - an angle that measures less than 90 degrees.
Obtuse Angle - an angle that measures more than 90 degrees, but less than 180 degrees.
Complementary - two angles that add together to equal 90 degrees.
Supplementary - two angles that add together to equal 180 degrees.
Vertical - Angles which are opposite from each other.
Adjacent - angles that are next to each other.

When two lines intersect, they form four angles:

$\angle$ABC $\angle$ABD
$\angle$DBE $\angle$EBC



Vertical angles, such as $\angle$ABC and $\angle$DBE, are equal in measure and adjacent angles, such as $\angle$ABD and $\angle$DBE, are supplementary.

Exercises:

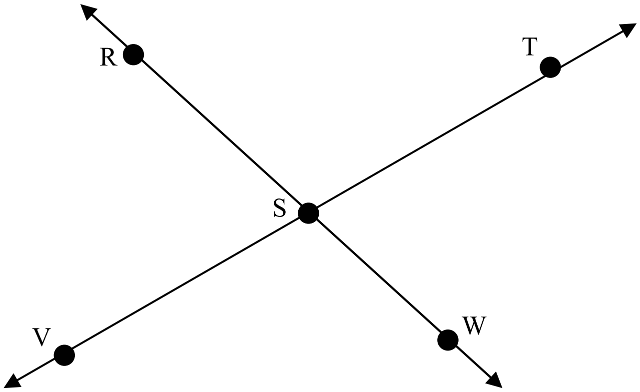
1. In the above example, list two acute angles and two obtuse angles

   Acute ____________, ___________ Obtuse ___________, ___________

2. If you have a 43º angle, what is the measure of the angle which is complementary to it?

3. If you have a 43º angle, what is the measure of the angle which is supplementary to it?

4. Using the figure, list two pairs of vertical angles and two pairs of adjacent angles.



Geometry II

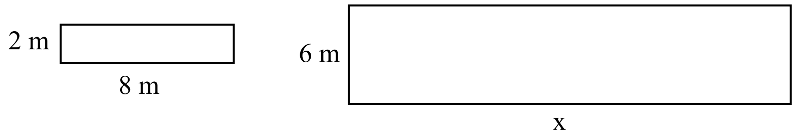
Hints/Guide:

In order to add to our knowledge of geometry, here are some additional terms:

Congruent - two figures which are the same shape and the same size.

Similar - two figures which are the same shape but different size.

In similar triangles, congruent angles in the same location in the figure are called corresponding angles. The sides opposite corresponding angles are called corresponding sides. The measures of corresponding angle or of corresponding sides of similar triangles are proportional. For example:



$\frac{2}{6} = \frac{8}{x}$ so since 2x = 48

x = 24 m

Exercises: Solve for the indicated variables (All figures are similar):

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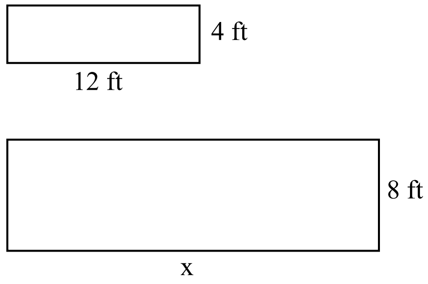

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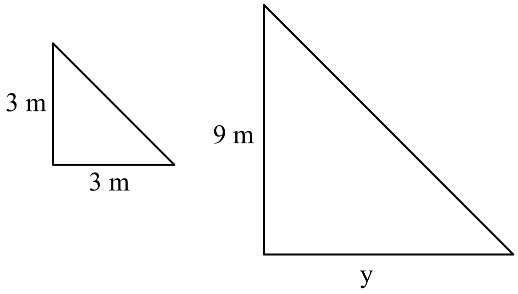

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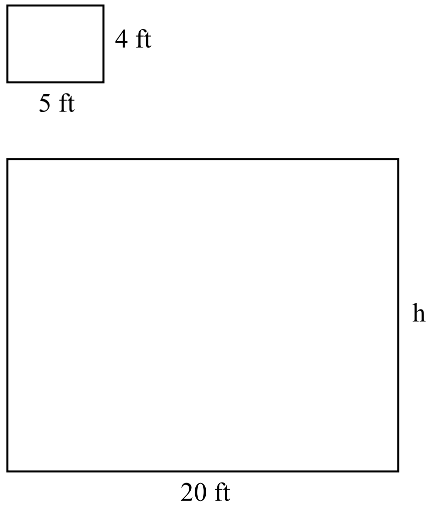

4.