

## Happy Summer!

In an effort to prevent the dreaded “Summer Slide”, we are sending home this math packet for students to work on at their own pace over break.

The topics included are entirely a review of what we learned this past school year. If your child comes across a topic they have forgotten, don't worry! Most pages have a quick refresher at the top to help them get back on track. Students can also search for helpful instructional videos on Khan Academy if they need a little extra guidance through any of the topics.

This complete packet will be due by the end of summer vacation. Keep those math skills strong, and I look forward to seeing your student in the fall!

Have a safe and happy summer!

Mrs. Fedak

[kfedak@smsberea.org](mailto:kfedak@smsberea.org)

Topics for incoming 8th graders include:

- Fraction Operations
- Decimal Operations
- Renaming Fractions, Percents, and Decimals
- Adding Mixed Numbers
- Subtract Mixed Numbers
- Multiply Mixed Numbers
- Divide Mixed Numbers
- Find the Percent of a Number
- Solve Problems Using Percents
- Operations with Integers
- Solving One-Step, Two-Step, and Multi-Step Equations
- Inequalities
- Volume and Surface Area of 3D Figures
- Angle Relationships



## Summer Mathematics Packet

### 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

$$12 = 12, 24, 36, 48, 60, 72, 84, \dots$$

$$15 = 15, 30, 45, 60, 75, 90, 105, \dots$$

$$\text{LCM}(12, 15) = 60$$

$$\text{So, } \frac{7}{12} + \frac{8}{15} = \frac{35}{60} + \frac{32}{60} = \frac{35+32}{60} = \frac{67}{60} = 1\frac{7}{60}$$

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:

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

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.  $\frac{6}{11} \cdot \frac{2}{3} =$

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

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



Summer Mathematics Packet

**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:

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

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  $0.6 \times 100 = 60$  and

$$\frac{3}{5} = 0.6 = 60\%$$

To convert a percent to a decimal, we divide the percent by 100,  $60\% \div 100 = 0.6$  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	

## Summer Mathematics Packet

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

Summer Mathematics Packet

Subtract Mixed Numbers

Hints/Guide:

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

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

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

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

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

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

## Summer Mathematics Packet

### 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:

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

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

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

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.  $6\frac{2}{3} \cdot 7\frac{3}{7} =$

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

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

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

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

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

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

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

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

## Summer Mathematics Packet

### 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:

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

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.  $6\frac{4}{7} \div 3\frac{3}{5} =$

## Summer Mathematics Packet

### 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:

$$4.5\% \text{ of } 240 = 4.5\% \times 240 = 0.045 \times 240 = 10.8$$

Exercises: Solve for n:

No Calculators!

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

1.  $305\% \text{ of } 450 = n$

2.  $7.5\% \text{ of } 42 = n$

3.  $120\% \text{ of } 321 = n$

4.  $15\% \text{ of } 54 = n$

5.  $0.65\% \text{ of } 320 = n$

6.  $800\% \text{ of } 64 = n$

7.  $95\% \text{ of } 568 = n$

8.  $150\% \text{ of } 38 = n$

9.  $215\% \text{ of } 348 = n$

10.  $85\% \text{ of } 488 = n$

11.  $9.05\% \text{ of } 750 = n$

12.  $160\% \text{ of } 42 = n$

13.  $60\% \text{ of } 78 = n$

14.  $0.4\% \text{ of } 480 = n$

15.  $0.10\% \text{ of } 435 = n$

16.  $2.4\% \text{ of } 54 = n$

## Summer Mathematics Packet

### 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 ( $.05 \times 450 = 22.5$ ), 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?

## Summer Mathematics Packet

### 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.  $45.9 - (-9.2) + 5 =$

Summer Mathematics Packet

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.  $4 \cdot (-3) \cdot 6 =$

2.  $5(-12) \cdot (-4) =$

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

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:

$$1. x + 5 = 6$$

$$\begin{array}{r} -5 \quad -5 \\ \hline x = 1 \end{array}$$

$$\begin{array}{l} \text{Check: } 1 + 5 = 6 \\ \qquad \qquad \qquad 6 = 6 \end{array}$$

$$2. t - 6 = 7$$

$$\begin{array}{r} +6 \quad +6 \\ \hline t = 13 \end{array}$$

$$\begin{array}{l} \text{Check: } 13 - 6 = 7 \\ \qquad \qquad \qquad 7 = 7 \end{array}$$

$$3. \frac{4x}{4} = \frac{16}{4}$$

$$\begin{array}{r} x = 4 \end{array}$$

$$\begin{array}{l} \text{Check: } 4(4) = 16 \\ \qquad \qquad \qquad 16 = 16 \end{array}$$

$$4. 6 \cdot \frac{r}{6} = 12 \cdot 6$$

$$r = 72$$

$$\begin{array}{l} \text{Check: } 72 \div 6 = 12 \\ \qquad \qquad \qquad 12 = 12 \end{array}$$

Exercises: Solve the following problems:

No Calculators!

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

$$1. x + 8 = -13$$

$$2. t - (-9) = 4$$

$$3. -4t = -12$$

$$4. \frac{r}{4} = 24$$

$$5. y - 4 = -3$$

$$6. h + 8 = -5$$

$$7. \frac{p}{8} = -16$$

$$8. -5k = 20$$

$$9. -9 - p = 17$$

## Summer Mathematics Packet

### 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:

$$1. 4x - 6 = -14$$

$$\begin{array}{r} +6 \quad +6 \\ \hline 4x \quad = -8 \\ \hline 4 \quad \quad 4 \end{array}$$

$$x = -2$$

$$\text{Solve: } 4(-2) - 6 = -14$$

$$-8 - 6 = -14$$

$$-14 = -14$$

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

$$+4 \quad +4$$

$$-6 \cdot \frac{x}{-6} = -4 \cdot -6$$

$$x = 24$$

$$\text{Solve: } (24/-6) - 4 = -8$$

$$-4 - 4 = -8$$

$$-8 = -8$$

Exercises: Solve the following problems:

No Calculators!

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

$$1. -4t - 6 = 22$$

$$2. \frac{m}{-5} + 6 = -4$$

$$3. -4r + 5 = -25$$

$$4. \frac{x}{-3} + (-7) = 6$$

$$5. 5g + (-3) = -12$$

$$6. \frac{y}{-2} + (-4) = 8$$

Summer Mathematics Packet

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:

$$\begin{array}{r} 8x - 6 = 4x + 5 \\ - 4x \quad - 4x \\ \hline 4x - 6 = 5 \\ + 6 \quad + 6 \\ \hline \frac{4x}{4} = \frac{11}{4} \\ x = 2\frac{3}{4} \end{array}$$

$$\begin{array}{r} 5 - 6t = 24 + 4t \\ + 6t \quad + 6t \\ \hline 5 = 24 + 10t \\ - 24 \quad - 24 \\ \hline \frac{-19}{10} = \frac{10t}{10} \\ -1\frac{9}{10} = t \end{array}$$

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 has 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:

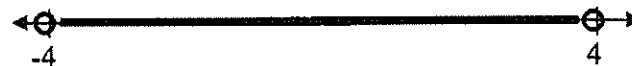
- |                                    |                        |                                 |
|------------------------------------|------------------------|---------------------------------|
| < is less than                     | > is greater than      | $\leq$ is less than or equal to |
| $\geq$ is greater than or equal to | $\neq$ is not equal to |                                 |

**Examples:**

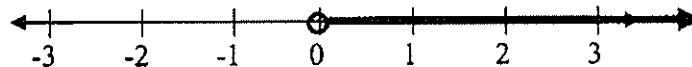
1. Integers between -4 and 4.



2. All numbers between -4 and 4.

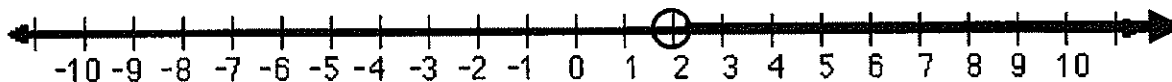


3. The positive numbers.



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.  $4x > 9$



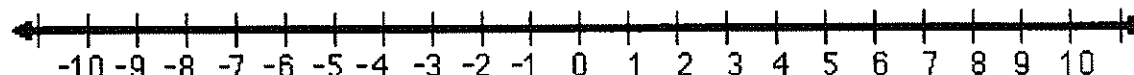
2.  $-5t \geq -15$



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



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



Summer Mathematics Packet

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

$$V = (\text{Area of Base}) \cdot (\text{Height})$$

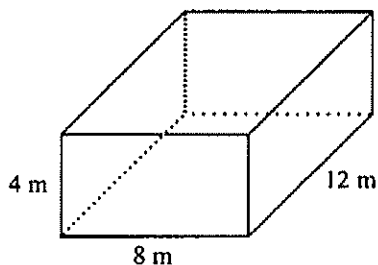
So, the volume of a rectangular prism can be determined if we can find the area of the base and the perpendicular height of the figure.

Exercises: Find the volume of the following figures:

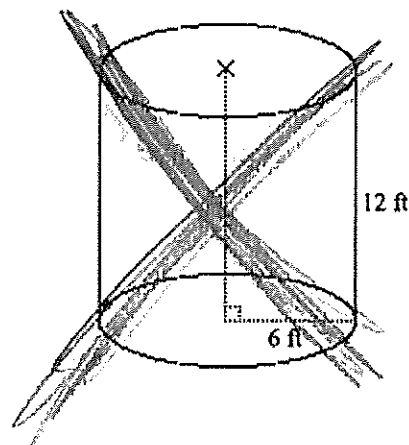
Note: Use  $\pi = 3.14$

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

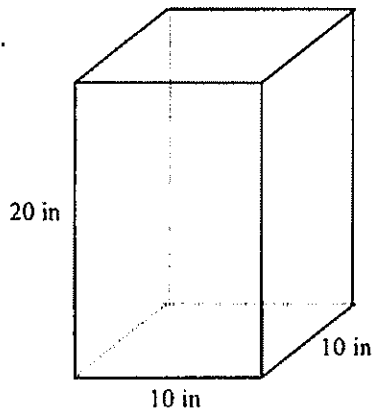
1.



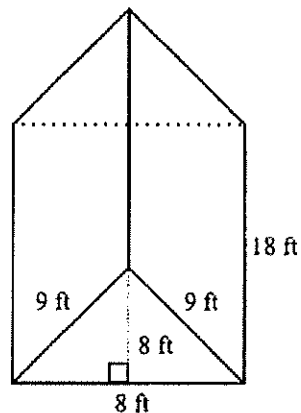
2.



3.



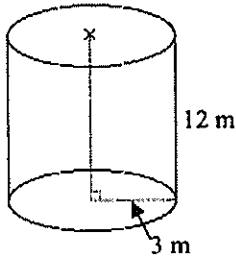
4.



Surface Area

Hints/Guide:

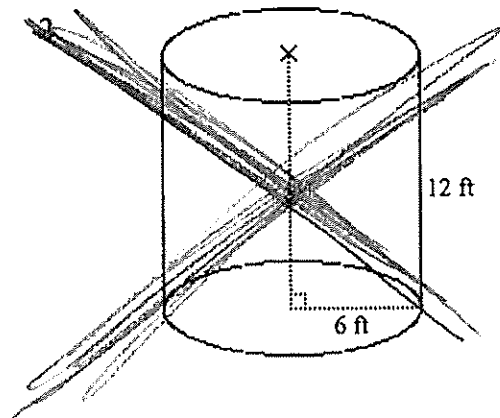
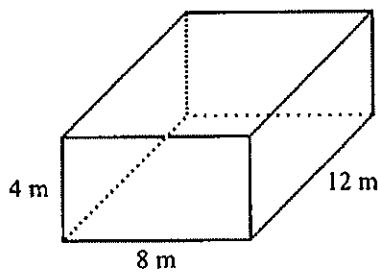
To determine the surface area of an object, we must find the areas of each surface and add them together. For a rectangular prism, we find the area of each rectangle and then add them together. For a cylinder, we find the area of each base and then add the area of the rectangle (the circumference of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



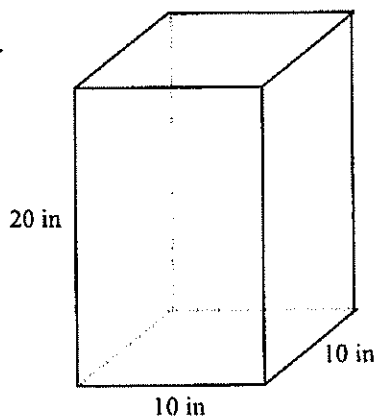
The area of each base is  $A = \pi r^2 = 3.14 \cdot 3 \cdot 3 = 28.26 \text{ m}^2$   
 and the area of the cylinder "wrap" is  
 $A = 2\pi rh$  (which is the circumference of the circle times the height of the cylinder)  
 $= 2 \cdot 3.14 \cdot 3 \cdot 12$   
 $= 226.08$   
 So the surface area is  $28.26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

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.

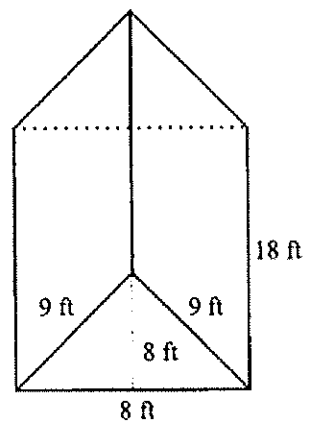
1.



3.



4.



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.

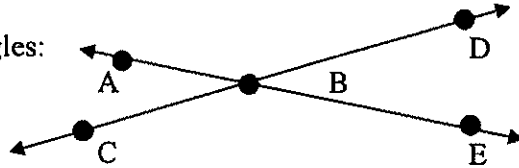
Supplementary - two angles that add together to equal 180 degrees.

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  $43^\circ$  angle, what is the measure of the angle which is complementary to it?
3. If you have a  $43^\circ$  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.

