Prealgebra

Instructions for the User

- To use Summer Math Skills Sharpener, simply tear off a page and complete it. The program is designed to be used 3 days per week for 10 weeks.

- Detailed solutions to all the problems are included at the back of the book. Please complete an entire sheet prior to checking your answers. You may want to remove the solutions and store them in a place apart from the book.

- All concepts are part of a standard prealgebra curriculum. Please attempt all problems. In addition to the solutions, pink "Help Pages" have been included to assist you in completing the problems.

- A yellow "Glossary of Terms" is located at the back of the book.

- Pages should be worked in order. While each page contains mixed concepts, individual concepts, within the book, have been ordered from easier to more difficult.

- If you experience difficulty with certain concepts, address the problem with your teacher. He or she may recommend additional help in these areas.

- It is important to give every problem your best effort. Problems may seem challenging, but use a combination of the "Help Pages" and the "Solutions" to assist you for maximum success.

- We appreciate your comments. Please complete the enclosed evaluation page after you have entered your next math course but before November 1st.

For problems 1 - 3, simplify. (Review the order of operations on the "help" pages.)

1. $-5+5$ 2. $8+3(2)-8$ 3. $-(-4)$

4. Name two fractions that are equivalent to $\frac{2}{5}$. _____, _____

5. Rename each of the following as decimals.

a. $\frac{1}{4}$ _____ b. $\frac{1}{2}$ _____ c. $\frac{3}{4}$ _____ d. $\frac{3}{8}$ _____ e. $\frac{5}{8}$ _____ f. $\frac{7}{8}$ _____

6. Consider 231.95 a. Which number is in the hundreds place? _____
b. Which number is in the hundredths place? _____

7. Order from largest to smallest: 9.4219 9.44 9.3025 9.38
_____ _____ _____ _____

8. (Mental Math) Tootsie Pops come in packages of 18. A teacher wants to buy enough for her 107 students. How many bags should she buy? _____

9. 150 is 40% of what number?

10. You are going to sift for primes using the Hundred Chart found in the back of your book. A prime number is a number that has only itself and one as factors. Please follow the instructions below.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

a. Cross off 1. One is not a prime number.
b. Circle 2, the first prime, in red and mark each multiple of 2 in the upper lefthand corner as shown.
c. Circle 3, the next prime, in green and mark each multiple of 3 in the upper righthand corner as shown.
d. Circle 5, the next prime, in blue and mark each multiple of 5 in the lower lefthand corner.
e. Circle 7, the next prime, in black and mark each multiple of 7 in the lower righthand corner.
f. Use your chart to find the least common multiple of 2, 3, and 5.
g. Find the greatest common factor of 21 and 28.

For problems 1 - 3, simplify.

1. $4 + -3$ 2. $1 + -5 \times 2$ 3. $-7 - (-2)$

4. Consider 483,195.26
   a. Identify the number in the thousands place. _____
   b. Identify the number in the tenths place. _____

5. Use the Hundreds Chart to answer the following :
   a. Name 3 common multiples of 3 and 2. _____ _____ _____
   b. Name 3 factors of 42. _____ _____ _____
   c. Name a common factor of 15 and 24. _____
   d. List the first 6 prime numbers. _____ _____ _____ _____ _____ _____

6. Rename the following as decimals. (Do not use a calculator.)
   a. $\frac{1}{3}$ _____ b. $\frac{2}{3}$ _____ c. $\frac{1}{5}$ _____
   d. $\frac{4}{5}$ _____ e. $\frac{7}{10}$ _____ f. $\frac{9}{10}$ _____

7. Write each of the following in decimal notation.
   a. Twenty - four thousand thirty. _____
   b. Eight million, two hundred three thousand, fifty. _____
   c. Five thousand and four thousandths. _____

8. Round 4.3278 to the nearest hundredth.
   _____

9. Find a number between 2.3 and 2.4.
   _____

10. The earth is about 93 million miles from the sun.
    a. Write this number in decimal notation. _____
    b. Write this number in scientific notation. _____

11. In 1988 Matt Biondi set an Olympic swimming record of 48.63 seconds for the 100 - meter freestyle. If this record were lowered by a tenth of a second, what would the new record be?

For problems 1 - 3, simplify.

1. $8 - 3 - (-8)$ 2. $-(-(-(-2)))$ 3. $-7 - 2(-4)$

4. Estimate the following to the nearest whole number.

   a. $2.9 + 3.6 + 3.2$ _____ b. $4.8 + 7.1$ _____

   c. $\$4.75 + \$2.95 + \$10.89$ _____ d. $\$10.25 - \$2.95$ _____

5. Rename each of the following as decimals.

   a. $2\frac{1}{4}$ _____ b. $5\frac{1}{2}$ _____ c. $-1\frac{3}{4}$ _____

6. (Mental Math) Tickets for the hockey game are $11.75 each. Tim has $35. Does he have enough money for three tickets? Justify your answer.

7. -8.3 is between what two integers?
   _____ and _____

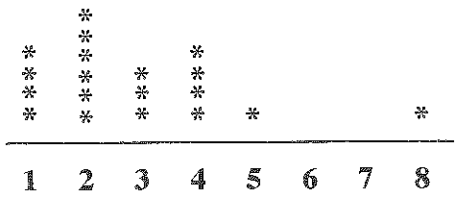
8. What is the greatest common factor of 18 and 24? _____

9. Write each of the following in decimal notation.

   a. 2.3×10^3 _____ b. 3.25×10^4 _____

   c. 1.42×10^6 _____ d. 2.5×10^{-2} _____

10. Jeff asked the members of his class to state the number of children in their families. He displayed his results below.



   a. How many families have only two children? _____

   b. How many families have four or more children? _____

   c. Jeff has two sisters and no brothers. How does he compare to his classmates?

   d. What is the mean number of children? _____

   e. What is the median number of children? _____

   f. Can you think of a situation where this data cannot be used?

For problems 1 - 3, simplify.

1. $\frac{2}{3}+\frac{2}{3}$ 2. $\frac{3}{4}+\frac{5}{2}$ 3. $-\frac{1}{4}-\frac{5}{8}$

4. Rename each of the following as a percent.

a. .05 _____ b. .001 _____ c. $\frac{1}{3}$ _____ d. 2 _____

5. Put in order from smallest to largest.

0.3 -2 -2.5 $\frac{1}{3}$ $-2\frac{1}{3}$ _____ _____ _____ _____ _____

6. Use your calculator to approximate π to the nearest millionth. _____

7. Round - 2.6 to the nearest integer. _____

8. Write as an inequality.

a. -3 is greater than -5. b. a is less than 10.

_____ _____

9. The population of Canada is about 28,400,000 people. Rename this number in scientific notation. _____

10. The tallest member of Mrs. Lu's homeroom is 74 inches. The shortest member is 58 inches. What is the range of heights? _____

11. What is the greatest common factor of 49 and 63? _____

12. What is the least common multiple of 12 and 18? _____

13. Estimate each of the following to the nearest whole number.

a. 2($4.95) + 3($2.80) _____ b. $\frac{3}{4}+\frac{7}{8}+\frac{1}{9}$ _____

14. One million is a 1 followed by _____ zeros.

1. Choose the correct symbol from $<$, $>$, or $=$.

   a. .246_____.2458 b. 3.20_____3.2 c. -1.5_____-1.6

   d. $\frac{1}{3}$ _____ $\frac{1}{4}$ e. 6.009_____6.0009 f. $\frac{1}{10}$ _____.10

2. Put in order from smallest to largest.

   $\frac{48}{49}$ $\frac{47}{48}$ $\frac{51}{52}$ $\frac{50}{51}$

   _____ _____ _____ _____

3. Represent each as a number.

   a. Three days ago. _____

   b. A loss of 5 yards. _____

4. Round -3.8 to the nearest integer. _____

5. Find $\sqrt{50}$ to the nearest hundredth. _____

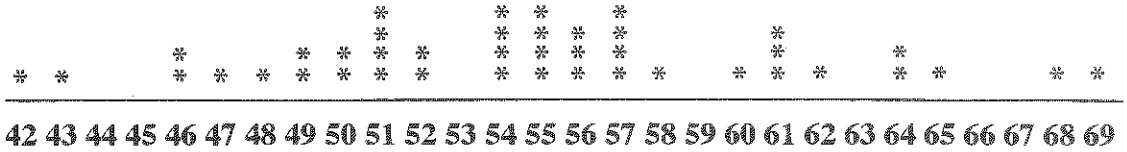
6. Write the calculator key sequence for $\frac{2+8}{2+3}$.

7. The population of China is about 1,200,000,000 people. Rename this number using scientific notation. _____

8. Abe had scores of 82, 88, 91, 79, 80 on his last five games of golf. Find his mean score. _____

9. Rick scored 87% on a 30 item test. How many did he answer correctly? _____

10. Below is a table that shows the ages of the American Presidents at the time of their inauguration.



42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69

   a. What is the range of the ages?

   b. What is the median age?

   c. Theodore Roosevelt was the youngest President ever elected. How old was he at the time of his inauguration?

   d. How many Presidents were 50 or younger at the time of their inauguration?

For numbers 1 - 4, solve for x.

1. $\frac{2}{3} = \frac{x}{57}$ 2. $\frac{3}{4} = \frac{x}{50}$ 3. $\frac{1}{5} = \frac{4}{x}$ 4. $\frac{3}{x} = \frac{8}{20}$

5. Find all the common factors of 18 and 30.

6. Write each decimal as a fraction.

a. .02 _____ b. .5 _____ c. $.\overline{3}$ _____ d. $.\overline{78}$ _____

7. What is the least common multiple of 3, 4, and 6? _____

8. Neptune is about 28,000,000,000 miles from the sun. Rename this number using scientific notation. _____

9. Complete the table of customary measures.

1 ft. = _____ in.	1 mi. = _____ ft.	1 yd. = _____ ft.
1 qt. = _____ pt.	1 lb. = _____ oz.	1 qt. = _____ cups
1 gal. = _____ qt.	1 ton = _____ lbs.	1 yd. = _____ in.

10. A local pet store is selling guppies for $.49 each and bowls for $5.00 each. If you have $8.00 in your pocket to spend on a bowl and some fish, what is the greatest number of fish you can buy?

11. Mr. Lombardi displayed his test results using the stem - and - leaf plot shown below.

5	2 3 5
6	0 9
7	1 5 6 7 7
8	2 2 8 9 9 9
9	2 3 4 6 9

7 | 1 = 71%

a. What were the highest and lowest scores? _____ and _____

b. What was the range of the scores? _____

c. What is the median score? _____

1. A variable is a symbol that can be replaced by a number. If $a = -3$ and $b = 5$, find :

   a. $a + b$ b. $-(a + b)$ c. $b - a$

2. Rename each percent as a decimal.

   a. 75% b. $8\frac{1}{2}\%$ c. 300%

   _____ _____ _____

3. Rename each decimal as a percent.

   a. .2 b. .02 c. .002

   _____ _____ _____

4. Order from smallest to largest.

   $\frac{1}{3}$ 3% .3 3×10^{-3}

   _____ _____ _____ _____

5. Find the least common multiple of 8 and 6.

   _____

6. In a recent poll, 80% of the students indicated that they would buy pizza if it were offered for lunch one day each week. If you randomly asked 20 students if they would buy pizza, how many would you expect to say "yes"? _____

7. The annual salaries of employees at a local small company are : president - $120,000; vice - president - $80,000; office manager - $32,000; secretary - $20,000; three sales persons - $18,000 each.

   a. Find the mean salary. _____

   b. Find the median salary. _____

   c. If you are a sales person, which measure of central tendency best describes the average salary. Explain your answer.

8. "There is a 100% chance of rain." Explain what this means.

9. In Naperville, a block is $\frac{1}{8}$ mile. How many feet is this? _____

10. The diameter of a red blood cell is 10^{-5} cm.

    Rename this number in decimal notation. _____

For problems 1 - 3, simplify.

1. $-|-5|$

2. $\frac{2}{3}+8\frac{1}{3}$

3. $2\frac{1}{10}+\frac{1}{5}$

4. **Convert each of the following.**

   a. 32 in. = _____ ft. b. 48 oz. = _____ lbs. c. 10 ft. = _____ yds.

5. **The wavelength of x - rays, in centimeters, is 3.048×10^{-9}. Rename this number in decimal notation.** _____

6. **The first four terms of a sequence are 3, 9, 27, 81.**

   a. **Find the next two terms.** _____, _____

   b. **In algebra you are trying to find patterns and then generalize these patterns to create a rule. Find a rule for the *nth* term in the pattern above.**

7. **28 is what percent of 50?**

8. **Everything in the store is marked down 25%. You find a CD player with an original price of $120.00.**

   a. **Find the new price.** _____

   b. **If sales tax is 6%, then what will be the final cost?** _____

9. **Calculate each quotient. Use a bar to show repeating decimals.**

   a. $\frac{2}{3}$ _____ b. $\frac{1}{7}$ _____ c. $\frac{2}{11}$ _____ d. $\frac{5}{6}$ _____

10. **What number am I?**

    a. **The sum of my digits is 9.**

    b. **I am odd.**

    c. **I am more than 100.**

    d. **I am a power of 3.**

11. **List the prime factors of 210.**

12. **Find the value of each of the following :**

    a. 2^0 _____ b. 2^1 _____ c. 2^2 _____

    d. 2^3 _____ e. 2^4 _____ f. 2^5 _____

For problems 1 - 3, simplify.

1. $-3+5^2$ 2. $-4-(-6)$ 3. $-3-8(-2)$

4. Convert

a. 40 cm. = _____m. b. 90 ml. = _____ l. c. 80 km. = _____ m.

d. 3 kg. = _____ g. e. 5 cm. = _____ mm. f. 5000 g. = _____ kg.

5. Match the power of ten with the appropriate metric prefix.

centi	10^3
deci	10^{-2}
milli	10^{-1}
kilo	10^{-3}

6. The size of a virus, in centimeters, is estimated as .000000914. Rename this number in scientific notation. _____

7. The first four terms of a sequence are 16, 8, 4, 2.

a. Find the next two terms. _____, _____

b. Find a rule for the *nth* term.

8. Rename $\frac{1}{17}$ as a decimal. Does the decimal repeat? Explain your answer.

9. Add parentheses to make each of the following true.

a. $2+2\times3=12$ b. $12-6\div2=3$ c. $8\times3+3\times2=96$

10. Use distribution to find each missing number or variable.

a. $2(a+b)=2(\ \ )+2(\ \ )$ b. $(\ \ )(2+x)=14+7x$

11. Write in exponential form.

a. $4\times4\times4\times4$ b. $2.1\times2.1\times2.1$ c. $y\times y\times y\times y\times y$

_____ _____ _____

12. Name two fractions that are equivalent to $\frac{3}{4}$. _____, _____

For problems 1 - 4, solve for x.

1. $\frac{2}{3} = \frac{15}{x}$ 2. $\frac{4}{5} = \frac{x}{85}$ 3. $\frac{1}{6}x = \frac{3}{10}$ 4. $\frac{x}{4} = -8$

For problems 5 and 6, simplify.

5. $2 + 3^2 \times 8 - 1$ 6. $(8 + 2^2) \times 2 + 8$

7. If $x = 5$, find $2x^2 - 3$.

8. Use $<$, $>$, or $=$ to make each statement true.

   a. $2 + 7 \times 3$ _____ $2 \times 7 + 3$ b. $4 \times 4 - 2$ _____ $4 \times (4 - 2)$ c. $8 - 2 \times 4$ _____ $2 \times 4 - 8$

9. An expression occurs when numbers and variables are combined using arithmetic operations. David is x years older than Michael. If Michael is 12, write the expression for David's age. _____

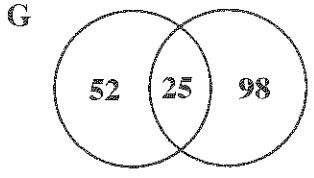
10. Given : $a = 3$ and $b = -5$, find

    a. $a + b$ b. ab c. $a - b$ d. $2a + b$

11. A formula is an equation that states a single variable is equal to an expression. The formula for the area, A, of a rectangle with length, l, and width, w, is $A = lw$. Find the area of a rectangle with $l = 2.3$ in. and $w = 1.8$ in.

12. The perimeter, p, of a polygon is the sum of the length of its sides. Find the perimeter of a triangle with sides of 4.2 cm, 6.2 cm, and 5.1 cm.

13. The diagram below shows a group of students who took German and/or Spanish.



G is the set who took German.
S is the set who took Spanish.

    a. How many students are in the entire group? _____

    b. How many students studied both languages? _____

    c. If a student is chosen at random, what is the probability he/she took German? _____

For problems 1 - 3, simplify.

1. $\frac{1}{3}+\frac{2}{15}$ 2. $\frac{3}{4}-\frac{5}{6}$ 3. $\frac{2}{9}+\frac{-1}{3}$

4. Find the area of a rectangle with $l = 9$ cm. and $w = 3.1$ cm.

5. Evaluate : $x^2 - 4x + 6$ for $x = 4$.

6. Guy is y times Robin' s age. If Robin is 9, write the expression for Guy' s age.

For problems 7 and 8, simplify.

7. $\frac{8-5+6}{2}$ 8. $3(2-(2-5))$

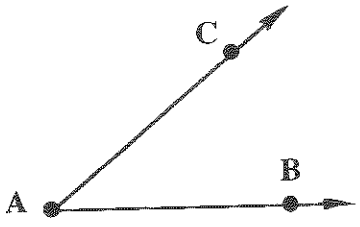
9. Write an expression to represent each of the following :
   a. Three times a number, n, and 8. _____
   b. The difference between Jill's age, a, and 10. _____
   c. Ten minus twice a number, n. _____

10. Which is larger? (Use < or >)
    1 kilogram _____ 1 pound 1 kilometer _____ 1 mile 1 liter _____ 1 quart

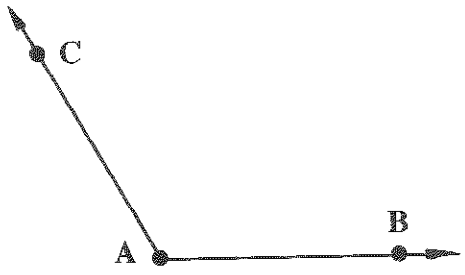
11. One liter = 1.06 quarts. If your family car has a 15 gallon tank, approximately how many liters will it hold?

12. Use a protractor to measure the angles below.

a.



b.



13. What is the least common multiple of 4, 6, and 9? _____

For problems 1 - 4, simplify.

1. $\frac{1}{5} - \frac{3}{10}$

2. $\frac{2}{3} - \left(-1\frac{5}{6}\right)$

3. $2\frac{1}{4} - \frac{3}{8}$

4. $10 - 2(8 - 2(4 - 1))$

5. **Evaluate :** $2x + 8y^2$ **for** $x = -2$ **and** $y = -3$.

6. **The formula for the area,** A**, of a circle with radius,** r**, is given by** $A = \pi r^2$.
   Find the area of a circle with $r = 3$ **m.**

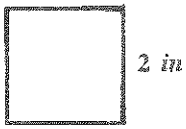
7. **One kilometer = .62 mile. While driving in Canada, you see that the speed limit is 85 km/hr. Convert this to mi/hr.**

8. **Match :**
   i. **acute angle**
   ii. **obtuse angle**
   iii. **right angle**
   iv. **straight angle**

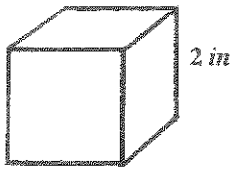
_____ _____ _____ _____

For 9 and 10, the area, A**, of a square with side,** s**, is given by** $A = s^2$**. The volume,** V**, of a cube with side,** s**, is given by** $V = s^3$.

9. **Find the area.**



10. **Find the volume.**



11. **Jan scored 83, 95, 90, and 71 on 4 math tests.**
    a. **Find his mean and median scores.** _____ _____
    b. **If 85 is the minimum for an A-, what grade would you give him? Justify your answer.**

12. **A number sentence is formed when two expressions are related using a math verb.**
    Examples of math verbs : $=$ $>$ $<$ $\geq$ $\leq$ $\neq$ $\approx$
    Kavita has d **dollars and Nicole has \$12. If together they have \$27, write a number sentence to describe this situation.**

13. **Use a protractor to draw a 50° angle.**

For problems 1 - 3, simplify.

1. $\frac{3}{8}+5\frac{5}{8}+\left(\frac{-3}{8}\right)$ 2. $\frac{1}{4}+\frac{5}{12}$ 3. $\frac{2}{3}-2\frac{5}{6}$

4. **The area of a perfectly square room is 64 square feet. What is the length of a side?**

5. **The formula for the area, A, of a triangle with base, b, and height, h, is $A=\frac{1}{2}hb$. Find the area of a triangle with $b = 2.25$ cm. and $h = 5.3$ cm.**

6. **Use the rectangle pictured below. The width is 3 cm. and the length is 6 cm.**
   a. **Find the perimeter.**
   b. **Find the area.**

7. **Profit, p, is calculated by subtracting cost, c, from selling price, s, or $p = s - c$. Find the profit on a bicycle that cost the store $58 and sold for $110.**

8. **Which unit of metric measure would you use to measure each of the following?**
   a. **Length of your driveway** _____ b. **Weight of your dog** _____
   c. **Thickness of a nickel** _____ d. **Quantity of soda for a party** _____

9. **A liter is defined as a cube that is 10 cm. on a side.**
   a. **1 liter =** _____ **cm^3** b. **A two - liter bottle of soda is** _____ **cm^3**

10. **Which is larger, 2^{10} or 10^2? Justify your answer.**

11. **Charlotte worked h hours on Monday. On Tuesday she worked twice as many hours as she did on Monday. On Wednesday she worked two more hours than she did on Monday. Altogether she worked a total of 19 hours. Write a number sentence to describe this situation.**

12. **Find the least common multiple of 6, 9, and 18.** _____

13. **Write the calculator key sequence for $\frac{4-4^4}{4}$.**

For problems 1 - 3, simplify.

1. $\frac{2}{3} - \frac{3}{4}$ 2. $-\frac{2}{3} - \frac{5}{6}$ 3. $\frac{3}{4} - \frac{3}{8}$

4. Which unit of metric measure would you use to measure each of the following?
   a. Width of your hand _____
   b. Weight of a penny _____
   c. Distance you live from school _____
   d. Dose of medicine for your cat _____

5. Omar has 4 pairs of slacks and 5 shirts. How many different outfits can he create?

6. A picture 11"×14" is surrounded by a frame that is 1" wide. What is the area of the frame?

7. Find the area of a triangle with h = 3.2 in. and b = 10 in.

8. Draw the next two figures that continue the pattern.

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*          *          *
         * *        * *
                   * * *
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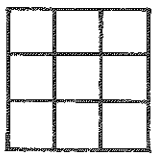
9. A metric standard of 1cm^3 of water = 1ml = 1g.
   a. What is the weight of one liter of water? _____
   b. If your bath tub holds about 48 liters of water, using grams, find the weight of the water. _____
   c. Convert your answer in b to kilograms. _____

10. Phoebe does aerobic dance every other day. Maggie does it every third day. Maria does it every fourth day. They did their aerobic dance together last Monday. On what day will they be together again?

11. How many squares are in the drawing below? _____



For problems 1 - 3, simplify.

1. $8 - 2(-3)$ 2. $9 - (-9)$ 3. $\dfrac{-8 - 2(-4)}{4 - 8}$

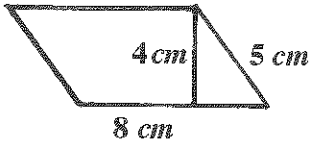
4. **Compare using >, <, or = .**

   a. $|-3|$ _____ $|3|$ b. $|-3 - 1|$ _____ $|3 - 1|$ c. $|-2 \times 8|$ _____ $|2 \times 8|$

5. **The formula for the area, A, of a parallelogram with height, h, and base, b, is $A = bh$. Use the parallelogram at the right.**

   a. **Find the area.**

   b. **Find the perimeter.**



6. **List the prime factors of 48.**

7. **The first four numbers of a sequence are 3, 6, 9, 12.**

   a. **Find the next two numbers.** _____, _____

   b. **Find a rule for the *nth* term.**

8. **If $x^n = 625$, and x and n are integers between 1 and 10, find x and n.**

   $x =$ ____ $n =$ ____

9. **Match :**

The area of your lawn	square kilometers
The area of the state of Texas	square meters
The area of your thumb nail	square centimeters
The area of a book cover	square millimeters

10. **Your learning buddy, Ima Fowlup, is having trouble understanding the rules for multiplying negative numbers. As partners the two of you do the following problems and record your results.**

    a. $(-1)(2) =$ $(1)(-2) =$ $(-1)(-2) =$

    b. **Together you conclude that the product of a positive number times a negative number has a _____ sign. The product of two negative numbers has a _____ sign.**

For problems 1 - 4, simplify.

1. $(-5)(2)$ 2. $(-2.5)(-6)(-21)$ 3. $(9)(-1.3)(-5.9)$ 4. $\frac{100+10}{100-45}$

5. A bag contains marbles in 3 different colors. What is the minimum number of selections needed to guarantee two marbles of the same color? _____

6. The sum of two integers is 18. The difference is 8. What are the numbers? (Hint: Write all the possible sums).

7. Find the area of a circle with $r = 2.5$ cm.

8. If $3\frac{1}{4}$ pounds of hamburger cost \$4.52, what is the cost per pound?

9. Explain to Ima Fowlup the error in the following simplification.

$$3(8 - 2(3)) = 3(6(3))$$
$$= 3(18)$$
$$= 54$$

10. Draw a square that is 2 cm. on a side. Draw a second square that is 6 cm. on a side.
    a. Find the perimeter of each square.
    b. Find the area of each square.
    c. The perimeter of the larger square is _____ times that of the smaller square.
    d. The area of the larger square is _____ times that of the smaller square.

11. Bobby Jo bought 3 hamburgers for \$1.29 each and 2 fries at x dollars each. She spent a total of \$5.45.
    a. Write a number sentence that will represent this situation.

    b. Find the cost of the fries.

12. The $\sqrt{20}$ is between _____ and _____.

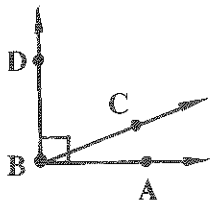
For problems 1 - 3, solve for x.

1. $x - 9 = 12$ 2. $8 - 2x = 20$ 3. $x + 4 = -8$

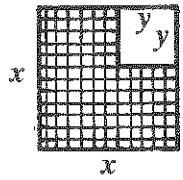
For problems 4 and 5, simplify.

4. $2x + 9x + 3x$ 5. $4m + 2m - 3m$

6. **Two angles are complementary if their sum is 90°. If the $m\angle ABC = 32°$, find $m\angle DBC$.**



7. **Represent the area of the shaded region.**



8. **Given : $a = -5$, $b = -7$, find :**

a. ab b. $b - a$ c. $-a - b$

9. **All the figures are quadrilaterals. Match them to their description.**

a. square	_____	Both pairs of opposite sides are parallel.
b. parallelogram	_____	One pair of opposite sides is parallel.
c. rhombus	_____	All angles are right angles and all sides are equal.
d. rectangle	_____	Two distinct pairs of consecutive sides are equal.
e. trapezoid	_____	Opposite sides are equal and all angles are right angles.
f. kite	_____	Opposite sides are equal.

10. **Find :**

a. 2^2 _____ b. 3^2 _____ c. 4^2 _____ d. 5^2 _____ e. 6^2 _____

f. 7^2 _____ g. 8^2 _____ h. 9^2 _____ i. 10^2 _____

11. **The $\sqrt{68}$ is between _____ and _____.**

12. **16 is 20% of what number?**

13. **If $x^n = 32$ and x and n are integers between 1 and 10, find x and n.**

$x =$ _____, $n =$ _____

For problems 1 - 3, solve for x.

1. $x - 5 = 10$ 2. $x - \frac{1}{4} = -\frac{1}{2}$ 3. $2x - 8 = -13$

4. Extend the powers of 10.

   a. 10^0 _____ b. 10^1 _____ c. 10^2 _____ d. 10^3 _____ e. 10^4 _____

   f. Predict 10^6 and check with your calculator. _____

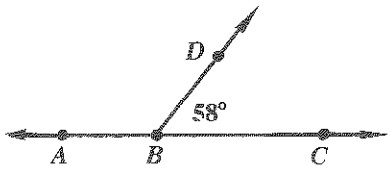
   g. Make a conclusion about the exponent and the number of zeros.

5. The formula $A = p(1 + r)^t$ gives the final amount, A, in an account with an initial investment called the principal, p, invested at rate, r, for time, t.

   a. Abdul invested $1000 in a 6 year certificate of deposit that is earning at an annual rate of 5%. How much will he have after the 6 years? (Change 5% to a decimal.)

   b. How much interest did he earn?

6. Two angles are supplementary if their sum measures 180°.
   Find $m\angle ABD$.



7. The first four numbers of a sequence are 25, 22, 19, 16.

   a. Find the next two terms. _____, _____

   b. Find a rule for the *nth* term.

8. Heidi earns $5.25 per hour.

   a. Complete the table to show her wage, w, for the hours, h, worked.

h	1	2	3	4	5	h
w	5.25					

   b. Write an equation for her wage, w, in terms of hours, h.

9. Consider the expression : $4w + 3x - 7y - 2w$

   a. How many terms are in this expression? _____

   b. What is the coefficient of y? _____

   c. Name two like terms. _____

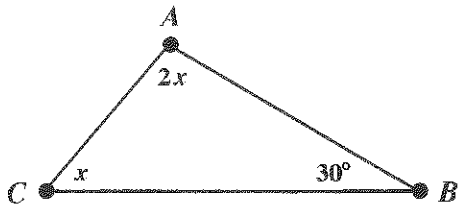
   d. Name two unlike terms. _____

For problems 1 - 3, solve for x.

1. $x - \frac{1}{4} = \frac{3}{4}$ 2. $12 - x = 15$ 3. $\frac{2}{3} - x = \frac{1}{6}$

4. **Find the area of a parallelogram with $b = 3.8$ ft. and $h = 7.1$ ft.**

5. **The sum of the angles of a triangle is 180°.**
   a. **Write a number sentence to represent the situation pictured at the right.**
   b. **Find the $m\angle C$.**



6. **The number 3^4 means _____ is a factor _____ times.**

7. **Using the number 12 :**
   a. **Give four factors of 12. _____, _____, _____, _____**
   b. **Give four multiples of 12. _____, _____, _____, _____**

8. **Simplify : $3x - 2y + 5x + z$**

9. **Write the number sentence to describe "a number plus 3 is -18."**

10. **Ima Fowlup solved $x - 5 = -3$ and got $x = -8$. Explain the mistake and correctly solve the problem.**

11. a. **Complete the table.** b. **Find a rule for each next term.**

x	2	3	4	5	6	7	8
y	5	7	9			15	

12. **Ten years ago Missy placed $500 in a mutual fund that has paid an average annual interest rate of 10%. A trip to Washington, D.C. costs $1100. Does she have enough money? Show your work to justify your answer.**

1. Simplify :

a. $\frac{7}{21}$ _____ b. $\frac{9}{27}$ _____ c. $\frac{4}{24}$ _____ d. $\frac{9}{2}$ _____ e. $\frac{10}{4}$ _____

2. Find : a. 2^1 _____ b. 3^0 _____ c. 10^4 _____ d. 10^{-1} _____

For problems 3 - 5, solve for x.

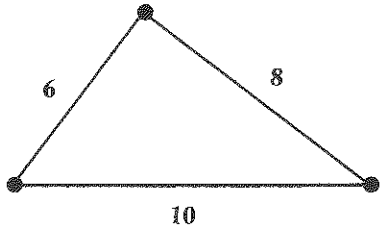
3. $\frac{2}{3}x = 6$ 4. $\frac{x}{2.5} = \frac{-8.1}{.5}$ 5. $\frac{x}{8} = \frac{1}{4}$

6. Write the number sentence to describe "Twice a number plus 6 is 24."

7. Use the right triangle below. The legs are 6 units and 8 units and the hypotenuse is 10 units.

a. Find the perimeter.

b. Find the area.



8. Using the number 20 :

a. List four factors of 20. _____, _____, _____, _____

b. List four multiples of 20. _____, _____, _____, _____

For problems 9 and 10, simplify.

9. $2x + 3x - 2y - y$ 10. $-3a - 5a + b$

11. Arthur wants to build a pen for his dog. He has 130 ft. of fencing. His pen can be only 25 ft. wide. How long will it be?

12. Charlie used $2\frac{1}{2}$ cups of sugar to make brownies and $1\frac{1}{3}$ cups to make peanut butter cookies. How much sugar did he use altogether? _____

13. Graph : $x \leq 3$ x

14. Evaluate : $3x^2 + y$ for $x = -3$ and $y = -1$.

For problems 1 - 3, solve for x.

1. $.3x = 6$ 2. $-9 + x = 1.2$ 3. $\frac{x}{3} = \frac{5}{2}$

4. **Mathematicians often use function notation to give a rule.**
   If $f(n) = 2n + 1$ then $f(1) = 2(1) + 1$ and $f(1) = 3$.
   Find the following :
   a. $f(2)$ b. $f(3)$ c. $f(-1)$

5. **Find the following :**
   a. $\frac{1}{3} \times 3$ b. $\frac{2}{3} \times \frac{3}{2}$ c. $5 \times \frac{1}{5}$
   d. **What can you conclude about any number** $\frac{1}{n} \times n$**?**

6. **Rename each of the following as a mixed number :**
   a. $\frac{10}{3}$ b. $\frac{5}{2}$ c. $\frac{7}{4}$ d. $\frac{11}{5}$ e. $\frac{9}{2}$

7. **Write the number sentence to describe "Two less than three times a number is 15."**

8. **List all the possible integer dimensions of a rectangle that has an area of 18 square units.**

9. **Is the fraction closer to 0,** $\frac{1}{2}$**, or 1?**
   a. $\frac{28}{29}$ b. $\frac{451}{900}$ c. $\frac{503}{601}$ d. $\frac{23}{946}$

10. **Give the number of sides of each of the following polygons.**
    a. **hexagon** _____ b. **triangle** _____ c. **octagon** _____
    d. **pentagon** _____ e. **nonagon** _____ f. **heptagon** _____

11. **The perimeter of a rectangular pen is 78 feet. If its width is 12.5 feet, what is its length?**

For problems 1 - 4, solve for x.

1. $x - \frac{2}{5} = \frac{1}{10}$ 2. $\frac{2}{3}x = 10$ 3. $5x = -10.5$ 4. $2x - 4 = -9$

5. Use $f(x) = 3x - 2$ to find :
   a. $f(1)$ b. $f(2)$ c. $f(3)$

6. It takes $\frac{1}{4}$ tsp. of pepper to make a recipe to feed four people. How much pepper do you need to feed ten people? Write the proportion to represent this situation.

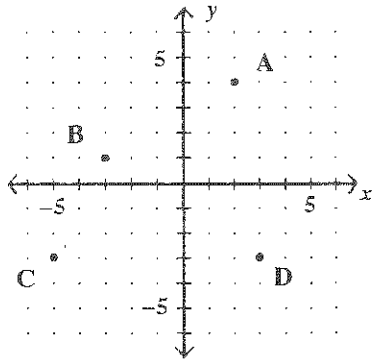
7. Graph : $x > 2$

8. Write the number sentence to describe "The product of 8 and a number, n, is 48."

9. What is the greatest common factor of 42, 84, 105?

10. Identify the ordered pairs on the graph at the right.

A = B =
C = D =



11. On a recent trip the Gomez family drove 397 miles on 12.8 gallons of gasoline. How many miles per gallon did they average?

12. What number am I?
   a. I am prime.
   b. The sum of my digits is 11.
   c. The product of my digits is 28.

13. If $2^x = 16$, find x.

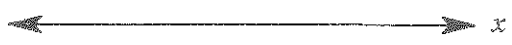
For problems 1 - 3, find the product and simplify.

1. $\left(\frac{2}{3}\right)\left(\frac{3}{4}\right)$ 2. $\left(\frac{5}{6}\right)\left(-\frac{3}{7}\right)$ 3. $\left(\frac{-2}{5}\right)\left(\frac{-3}{8}\right)$

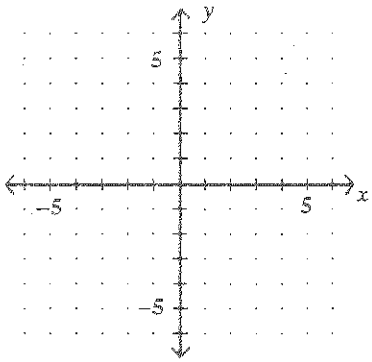
For problems 4 and 5, solve for x.

4. $2x - 3 = -11$ 5. $-\frac{3}{2}x + 5 = -10$

6. **Kim knows that the show starts at 3 : 00 p.m. It takes her $\frac{1}{2}$ hour to drive there and $1\frac{1}{4}$ hours to get ready. If she wants to arrive 15 minutes before showtime, when should she start to get ready?**

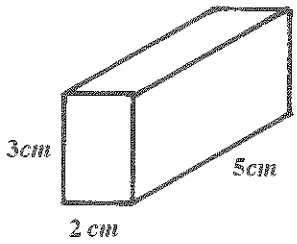
7. **Graph :** $-1 \le x \le 3$ 

8. **Plot the following points on the graph at the right.**



A = (0, 2) B = (2, 0)
C = (1, 5) D = (-3, 1)
E = (-2, -3) F = (3, -1)

9. **The surface area of a figure is the sum of the areas of all the faces of the solid. Find the surface area of the figure pictured at the right.**



10. **Write the number sentence to describe "Twice a number and its opposite are greater than 10."**

11. **Jelly beans cost \$1.29 per pound, p.**

a. **Complete the table.**

pounds	1	2	3	4	5	p
cost	1.29					

b. **Write a rule for the cost, c, in terms of pounds, p.**

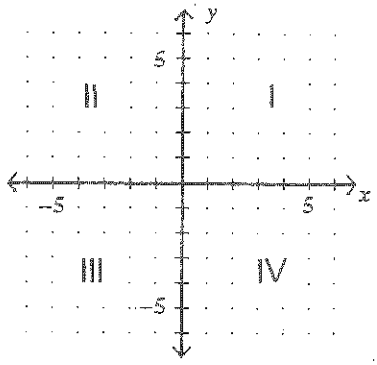
c. **Use your rule to find the cost of $2\frac{1}{2}$ pounds of jelly beans.**

For problems 1 - 3, solve for x.

1. $x - \frac{2}{3} = \frac{5}{6}$

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

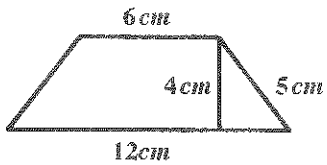
3. $\frac{x}{3} = \frac{5}{32}$



4. **Use the graph at the right.**
   a. **In which quadrants do x and y have opposite signs?**
   b. **In which quadrants do x and y have the same sign?**

5. **The formula for the area, A, of a trapezoid with bases, b_1 and b_2, and height, h, is $A = \frac{1}{2}h(b_1 + b_2)$. Use the trapezoid pictured at the right.**

   If $h = 4$ cm, $b_1 = 6$ cm, $b_2 = 12$ cm and the nonparallel sides = 5 cm:
   a. **Find the area.**
   b. **Find the perimeter.**

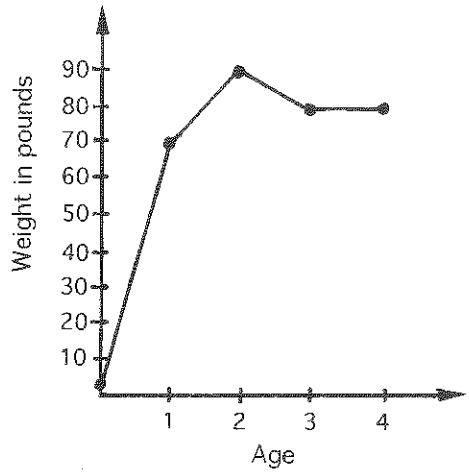


6. **Mom's rich brownie recipe calls for $\frac{3}{4}$ pound of butter. To triple the recipe, how much butter must you use?**

7. **The speed limit, s, on most parts of I - 75 is a maximum of 65 mph and a minimum of 45 mph.**
   a. **Express this as an inequality.**
   b. **Graph the inequality.** ⟷ s

8. **Su invested $2000 at 10.5% annual interest for 6 years.**
   a. **How much did she have at the end of the 6 years?**
   b. **Use trial - and - error to approximate the time it will take to double her investment.**

9. **Zeus is a 4 - year - old chocolate Lab. His weight at various ages is graphed at the right.**
   a. **About how much did he weigh at birth?** _____
   b. **What was his maximum weight?** _____
   c. **When did he go on a diet?** _____
   d. **What did he weigh on his fourth birthday?** _____



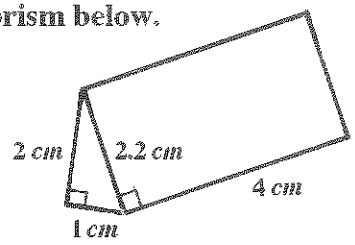
For problems 1 - 3, find the product and simplify.

1. $\left(\frac{1}{2}\right)\left(\frac{3}{4}\right)$ 2. $\left(1\frac{2}{3}\right)\left(\frac{4}{5}\right)$ 3. $\left(2\frac{3}{5}\right)\left(\frac{5}{7}\right)$

For problems 4 - 6, solve for x.

4. $4x + 2 = 16$ 5. $2 = -3 - x$ 6. $\frac{x}{2} - 3 = 6$

7. **Find the surface area of the prism below.**



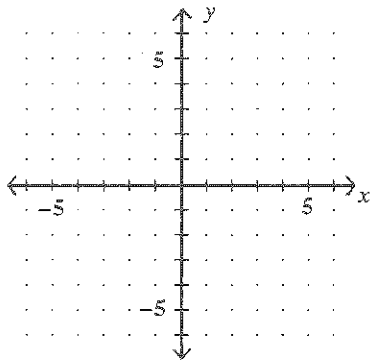
8. **The scale says 1 in. = 25 miles. If two towns are $3\frac{1}{2}$ inches apart on the map, what actual distance separates them?**

9. **The formula for the volume, V, of a sphere with radius, r, is $V = \frac{4}{3}\pi r^3$. Write the calculator key sequence for finding the volume of a sphere with $r = 4.2$ units.**

10. **"I'm thinking of a number between 1 and 10."**
    a. **Express this as an inequality.**
    b. **Graph this inequality.** ⟵——————⟶ n

11. a. **Find three pairs of numbers that satisfy the equation $x + y = 5$.**

    b. **Plot the points on the graph at the right and draw a line through them.**

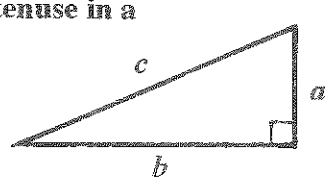


12. **Kristen has 3 pairs of shorts and 5 T - shirts.**
    a. **How many different outfits can she make?** _____
    b. **Her favorite shorts are blue and her favorite shirt is red. If she chooses her outfit in the dark, what is the probability she will choose this outfit?** _____

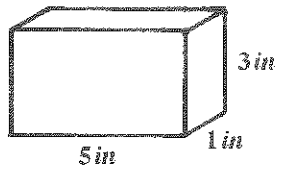
For problems 1 - 3, find the product and simplify.

1. $\left(\frac{3}{4}\right)\left(2\frac{1}{3}\right)$ 2. $\left(-\frac{1}{2}\right)\left(1\frac{1}{4}\right)$ 3. $\left(2\frac{1}{2}\right)\left(3\frac{1}{3}\right)$

4. **The Pythagorean theorem states that in a right triangle with legs, a and b, and hypotenuse, c, $c^2 = a^2 + b^2$. Find the length of the hypotenuse in a triangle with $a = 5$ units and $b = 12$ units.**



5. **The formula for the volume, V, of a prism with length, l, width, w, and height, h, is $V = lwh$. Find the volume of the prism at the right if $w = 1$ in, $h = 3$ in, and $l = 5$ in.**



For problems 6 and 7, solve for x.

6. $-\frac{1}{2}x = \frac{1}{4}$ 7. $\frac{2}{3}x = \frac{5}{6}$

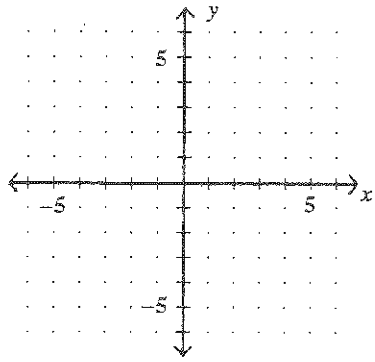
8. **Batting averages are found by dividing hits by times at bat. They are expressed as decimals. In 1995 Wade Boggs had 460 "at bats" and hit successfully 149 times. What was his batting average?** _____

9. **You have exactly $\frac{3}{4}$ cup of milk left and two hungry kittens. How much should Kasey and Bailey receive if they each receive equal amounts?** _____

10. **Twice a number and 6 is 34.**
    a. **Represent this situation using a number sentence.**

    b. **Find the number.**

11. a. **Find three pairs of numbers that satisfy the equation**
    $$x - y = 2.$$
    b. **Plot these points on the graph at the right and draw a line through them.**



1. **Match each shape with its area formula.**

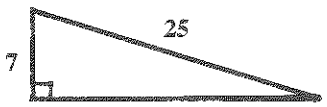
_____ rectangle	a. $A = \frac{1}{2}bh$
_____ square	b. $A = \frac{1}{2}h(b_1 + b_2)$
_____ trapezoid	c. $A = \pi r^2$
_____ circle	d. $A = lw$
_____ triangle	e. $A = bh$
_____ parallelogram	f. $A = s^2$

2. **Write O next to the pairs of numbers that are opposites and R next to the pairs of numbers that are reciprocals.**

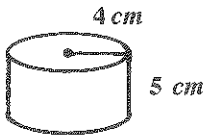
a. 4 and $\frac{1}{4}$ b. .001 and 1000 c. -6 and 6 d. $-\frac{2}{3}$ and $-\frac{3}{2}$

3. **The circumference, C, of a circle with radius, r, is given by $C = 2\pi r$. Find the circumference of a circle with $r = 3.1$ cm.**

4. **In the right triangle at the right, the hypotenuse is 25 units and the short leg is 7 units. Use the Pythagorean theorem to find the longer leg.**



5. **The formula for the volume, V, of a cylinder with radius, r, and height, h, is $V = \pi r^2 h$. Find the volume of the cylinder at the right with $r = 4$ cm and $h = 5$ cm.**

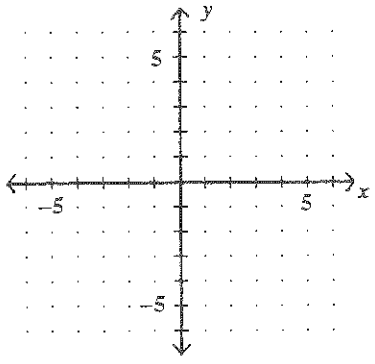


6. **If three pencils cost \$1.29, how many can you buy with \$10.00?**

7. a. **Find three pairs of numbers that satisfy the equation**

$$x + y = -6.$$

b. **Plot these points on the graph at the right and draw a line through them.**



For problems 1 - 3, find the quotient and simplify.

1. $3 \div \frac{1}{3}$ 2. $8 \div 1\frac{2}{3}$ 3. $-\frac{3}{4} \div \frac{1}{2}$

4. In 1911 Ty Cobb had a .420 batting average. If this former Detroit Tiger were to play this season and have 400 "at bats", about how many times might you expect him to have a base hit?

5. "Once around the neighborhood" is .9 mile. As part of your fitness program you jog this route three times.
   a. How far have you run? _____
   b. How many times will you have to run around your neighborhood if your ultimate goal is to jog more than 5 miles? _____

For problems 6 - 8, solve for x.

6. $-\frac{3}{4}x = 15$ 7. $-\frac{3}{5}x = \frac{2}{3}$ 8. $\frac{1}{2}x + 3 = 8$

9. A 2 - liter bottle of pop is on special for $1.29. A 6 - pack of the same pop costs $1.50. If a 6 - pack contains 2.13 liters, which is a better buy? Justify your answer.

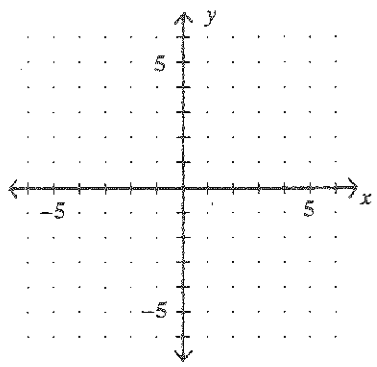
10. Can 15, 36, and 39 be lengths of a right triangle? Justify your answer.

11. Next year's freshman class is 20% larger than this year's class of graduating seniors. If 260 seniors graduate, how big is the incoming freshman class?

12. This summer Abhinav is going to babysit for a family with one child. His rate is $4.50 per hour. In July, if he babysits six hours each day for 20 days, how much will he earn?

13. a. Find three pairs of numbers that satisfy the equation
$$y - x = 3.$$

   b. Plot these points on the graph at the right and draw a line through them.



For problems 1 - 3, find the quotient and simplify.

1. $1 \div \frac{1}{2}$

2. $-2\frac{1}{3} \div \frac{5}{6}$

3. $\frac{\frac{4}{9}}{\frac{1}{3}}$

4. A recommended serving of cereal is $1\frac{15}{16}$ oz. If the box contains $15\frac{1}{2}$ oz, about how many servings does it contain?

For problems 5 - 7, solve for x.

5. $2x - 4 = 8$

6. $\frac{3}{4}x - 5 = 16$

7. $\frac{2}{3}x = \frac{5}{7}$

8. Shareen reads at a rate of 40 pages per hour. If she wishes to average 300 pages each week during the summer, how many hours must she read each week?

9. From a standard deck of 52 cards, you draw a card. Find each of the following.
   a. What is the probability it will be a club? _____
   b. What is the probability it will be a king? _____

10. It takes one pound of hamburger to make sloppy joes to feed 5 Boy Scouts. How much hamburger should be purchased to feed a troop of 28?
    a. Write the proportion to solve this problem.

    b. Solve your proportion to find the amount.

11. Simplify: $3m + 4n - 8m - (-2n)$

12. Find the greatest common factor of $2x^2$, $6x$, $8xy$.

13. Estimate:
    a. The area of a square that is 5.1 inches on a side. _____
    b. The square root of 83. _____
    c. The area of a backyard that is 38 feet by 22 feet. _____

For problems 1 - 3, simplify.

1. $\frac{2}{3}x + \frac{3}{4}y + \frac{1}{4}y$ 2. $8a - 7a$ 3. $2x^2 + 5x - x^2$

4. A jar contains 8 red, 5 blue, and 2 green marbles. A marble is selected at random. What is the probability that it will be green? _____

5. 15 is 20% of what number? 6. Solve for x: $2(x-2) = -3x + 3x - 8$

7. How many boys are on a bus with 45 children if the ratio of boys to girls is 4 to 5?

8. On a map the distance between Charlotte and Greensboro is about 4.5 inches. If 1 inch = 18.8 miles, then approximately how far apart are the two cities?

9. Consider the expression : $-3x + 5y - z$
   a. What is the coefficient of x? _____
   b. How many terms are in this expression? _____

10. The following items were purchased for the year - end team party. Complete the spread sheet below supplying the missing numbers.

a.

	A	B	C	D
1	Item	Number	Cost Per	Total
2	Hot dogs	150	.29	_____
3	Rolls	150	_____	15.00
4	Chips	_____	.38	30.40
5	Soft drinks	250	_____	150.00
6	Ice cream bars	150	_____	45.00
7	Popcorn	100	.15	_____
8	TOTAL			_____

   b. What number is in cell B4?
   c. If you double the number in B4, what other cells are affected?

