

Algebra 1 Part 1 Summer Math Packet  
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2010

**Directions:** Complete all ten problems below in the space provided. You must show all work neatly and in an organized fashion along with the correct answer to receive ten points. No scrap.

**Problem #1 (F&A) 10-2f,g:** Demonstrates conceptual understanding of linear and nonlinear functions and relations through describing how change in the value of one variable relates to change in the value of a second variable and working between and among different representations of functions and relations.

Members of a marching band are making their own color-guard flags. Each rectangular flag requires .6 square yards of material. The material costs \$2.00 per square yard.

- a) Write a verbal model that relates the number of flags and the total cost of the material.
  
  
  
  
  
  
  
  
  
  
- b) Write the verbal model as a variable expression.
  
  
  
  
  
  
  
  
  
  
- c) How much will it cost to make 20 flags?



**Problem #3 (F&A) 10-3a:** Demonstrates conceptual understanding of algebraic expressions by solving problems involving simplifying expressions.

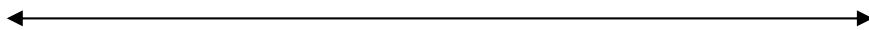
For the expression  $2x(x + 5) - x(2 - 3x)$ :

- a) Rewrite the expression without parentheses using the distributive property.
  
  
  
  
  
  
  
  
  
  
- b) Simplify the expression by combining like terms.

**Problem #4 (F&A) 10-2a:** Demonstrates conceptual understanding of linear and nonlinear functions and relations through analysis of constant, variable, or average rates of change.

For the real numbers  $4, -\frac{1}{2}, 6, -2, \frac{2}{3}, -1, 1$

- a) Graph the numbers on a number line.



- b) Write the numbers in increasing order.
  
  
  
  
  
  
  
  
  
  
- c) Write the absolute value of each number.

**Problem #5 (F&A) 10-4b,c: Demonstrates conceptual understanding of equality by translating problem situations into equations and solving linear equations.**

**At your summer job you earn \$8.00 per day, plus \$3.00 for each errand you run.**

- a) Write an equation that shows how much money you make in one day.
  
  
  
  
  
  
  
  
  
  
- b) How many errands would you need to run in order to make \$26.00 in one day? Write and solve the equation. Show ALL your work.

**Problem #6 (N&O) 10-4a: Accurately solves problems that involve but are not limited to proportional relationships.**

**You are visiting Canada and want to exchange \$175. in United States dollars for Canadian dollars. The rate of currency exchange is 1.466 Canadian dollars per United States dollar. How many Canadian dollars will you get? Round to the nearest dollar.**

**Problem #7 (F&A) 10-1b: Identifies, extends and generalizes a variety of patterns (linear and nonlinear) to solve problems represented by tables. (F&A) 10-2a,c,g: Demonstrates conceptual understanding of linear and nonlinear functions and relations through an analysis of constant, variable, or average rates of change, domain and range and working between and among different representations of functions and relations.**

**The table below shows how foot length relates to women's shoe sizes.**

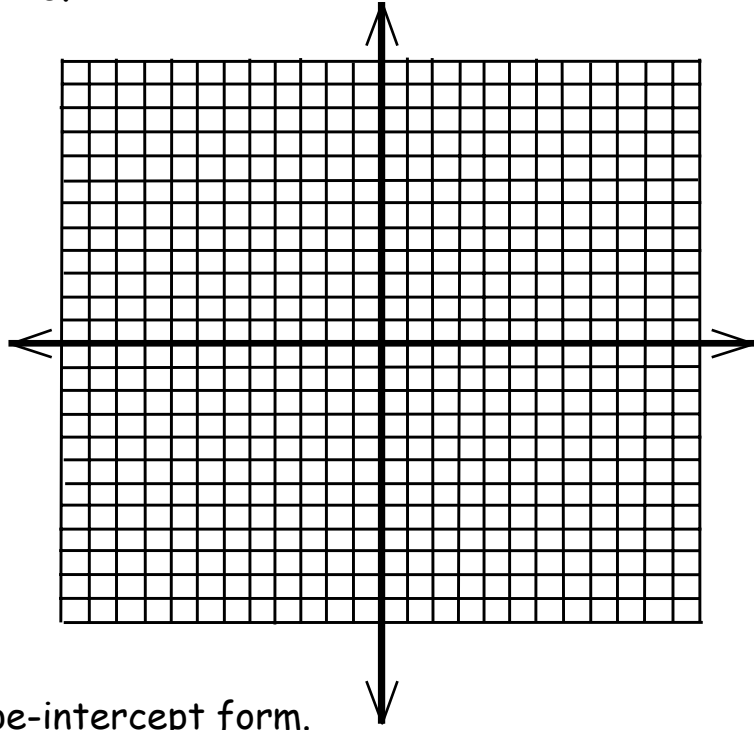
Foot length $x$ (in inches)	$9\frac{1}{4}$	$9\frac{1}{2}$	$9\frac{5}{8}$	$9\frac{3}{4}$	$9\frac{15}{16}$	$10\frac{1}{4}$	$10\frac{1}{2}$
Shoe size $y$	$6\frac{1}{2}$	7	7	8	8	$9\frac{1}{2}$	$9\frac{1}{2}$

a) Is shoe size a function of foot length? Why or why not?

b) If it is a function, give the domain and range.

**Problem #8 (F&A) 10-2b,g:** Demonstrates conceptual understanding of linear and nonlinear functions and relations through intercepts and working between and among different representations of functions and relations. **(G&M) 10-9d:** Solves problems on and off the coordinate plane involving slope.

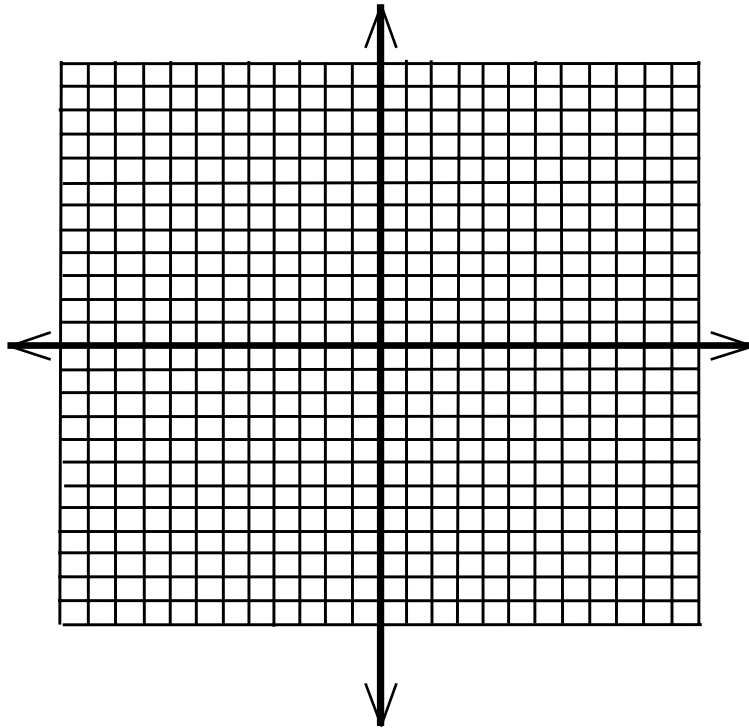
a) Graph the equation  $4x + y = 0$ .



b) Write the equation in slope-intercept form.

c) Find the slope and the y-intercept.

d) Plot the point  $(0, 0)$ . Draw a slope triangle to locate a second point on the line. Draw a line through the two points.



**Problem #9 (F&A) 10-2g:** Demonstrates conceptual understanding of linear and nonlinear functions and relations through working between and among different representations of functions and relations.

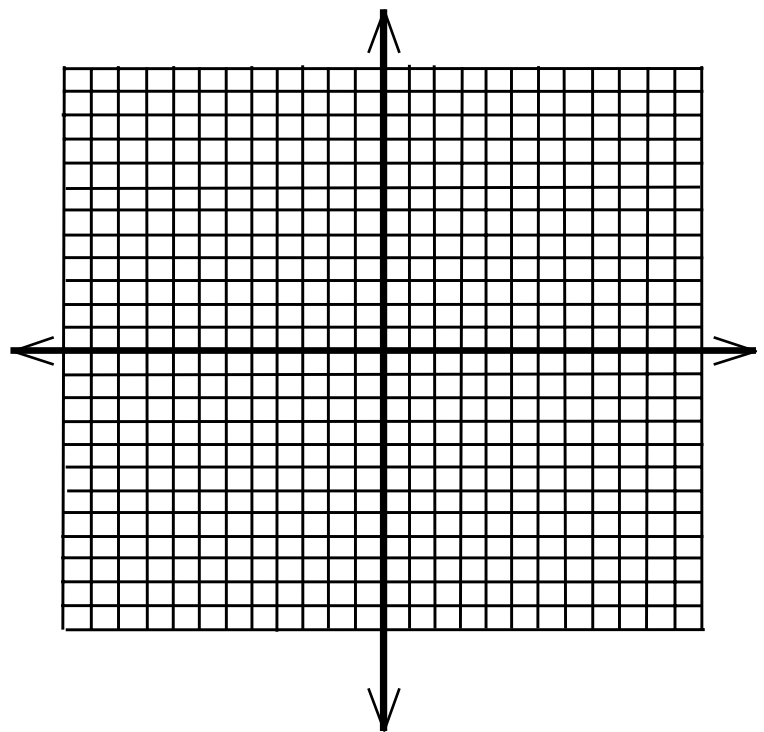
The homework club goes to an amusement park. Student tickets cost \$15.00 each. Non-student tickets cost \$25.00 each. The club paid \$315.00 for the tickets.

- a) Write in standard form an equation that relates the number of student tickets  $x$  with the number of non-student tickets  $y$ .

b) Write the equation in slope-intercept form and complete the table.

Number of student tickets, $x$	1	6	11	16	21
Number of non-student tickets, $y$					

c) Plot the points from the table and sketch the line.



**Problem #10 (F&A) 10-2a:** Demonstrates conceptual understanding of linear and nonlinear functions and relations through an analysis of constant, variable, or average rates of change. **(G&M) 10-9c,d:** Solves problems on and off the coordinate plane involving perpendicular and parallel lines and slope.

Determine whether the line  $y = 3x - 6$  is perpendicular to  $y = -\frac{1}{3}x + 2$ .

Recall that two lines are perpendicular if the product of their slopes is  $-1$ . Graph both lines.

