Name: _____

Heatherwood Mathletes

Heatherwood Math Olympics 2004-2005: Test 2 for Blue/Red Belts

February 24, 2005

A. Arithmetic with negatives (2 points each)

-18 + 3 =

-18 - 3 =

-24/12 =

-24/-12 =

5 x (-3) =

(-5) x (-3) =

B. Some Word Problems (not algebra, 3 points each)

B.1 There are 148 more blue beads than green beads in a box. If another 12 blue beads and 28 green beads are put into the box, how many more blue beads than green beads will there be in the box?

B.2 The square of the sum of 4 and 5 is?

B.3 Abe, Beth, and Carl together score all the points in the basketball game. If Abe scores 3/10 of the points and Beth scores 9/20 of them, what fraction of the points does Carl score?

B.4 How many basketball cards can be bought with $6.39 if each card costs 9 cents?

C. Algebra: Solve each equation for x (3 points each)

$3x - 4 = 8$

$9x + 4 = 3x - 8$

$\frac{2}{5}x - 2 = 4$

$5(x - 4) = 3(x + 4)$

$\frac{1}{2}(2x - 4) = \frac{1}{4}(3x - 4)$

$4(x + 2) + \frac{1}{2}(2x + 4) = 14$

D. Algebra Word Problems: Write each as an equation, then solve (5 points each)

D.1. When a number is multiplied by 5, it gives the same result as when 48 is added to twice the number.

D.1a. Write the algebriac equation for this problem.

D.1b. Now solve it for the number.

D.2. Find three consecutive even numbers such that 3 times the smallest added to two times the largest is equal to 62.

D.2a. Write the algebriac equation for this problem.

D.3b. Now solve it for the three numbers.

D.3 Simultaneous equation word problem. A number is larger than another by 4 and their sum is 32.

D.3a. Write the two algebraic equations for this problem.

D.3b. Now solve them for the two numbers.

D.4 Simultaneous equation word problem. The units digit of a two digit number is three times the tens digit. If the digits are reversed, the resulting number is 18 more than the original.

D.4a. Write the two algebraic equations for this problem.

D.4b. Now solve them for the original number.

E. Speed (4 points each)

Fill in the missing information in the following table.

Distance	Time	Speed
150 km	3 h	
	2 h	45 km/h
330 km		60 km/h

F. Graphing

F.1 Consider the equation $y = x + 1$. (8 points)

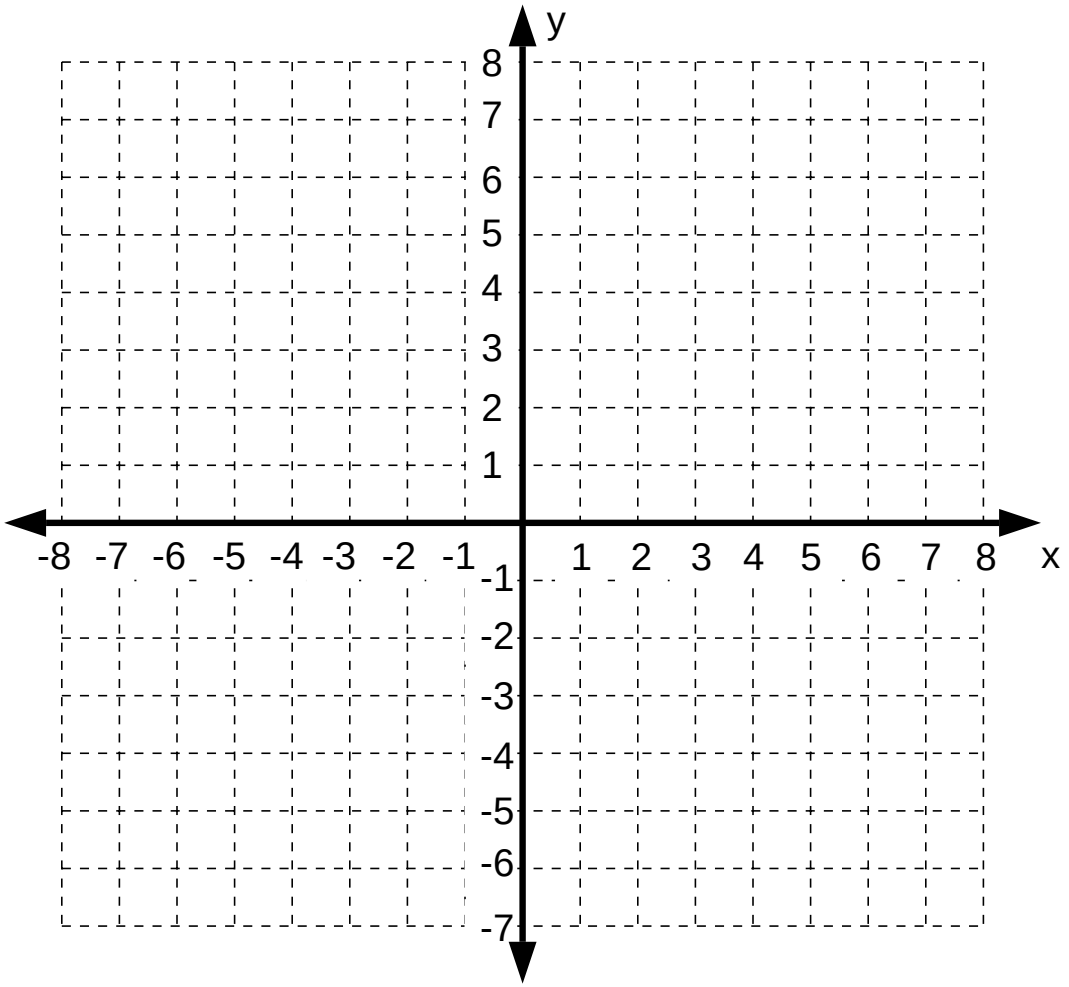
F.1a. What's the slope?

F.1b Does the graph rise or fall from left to right?

F.1c What's the y-intercept?

F.1d What's the x-intercept?

F.1e Now, graph the equation on the following graph.



F.2 Consider the equation $y = -2x - 1$. (8 points)

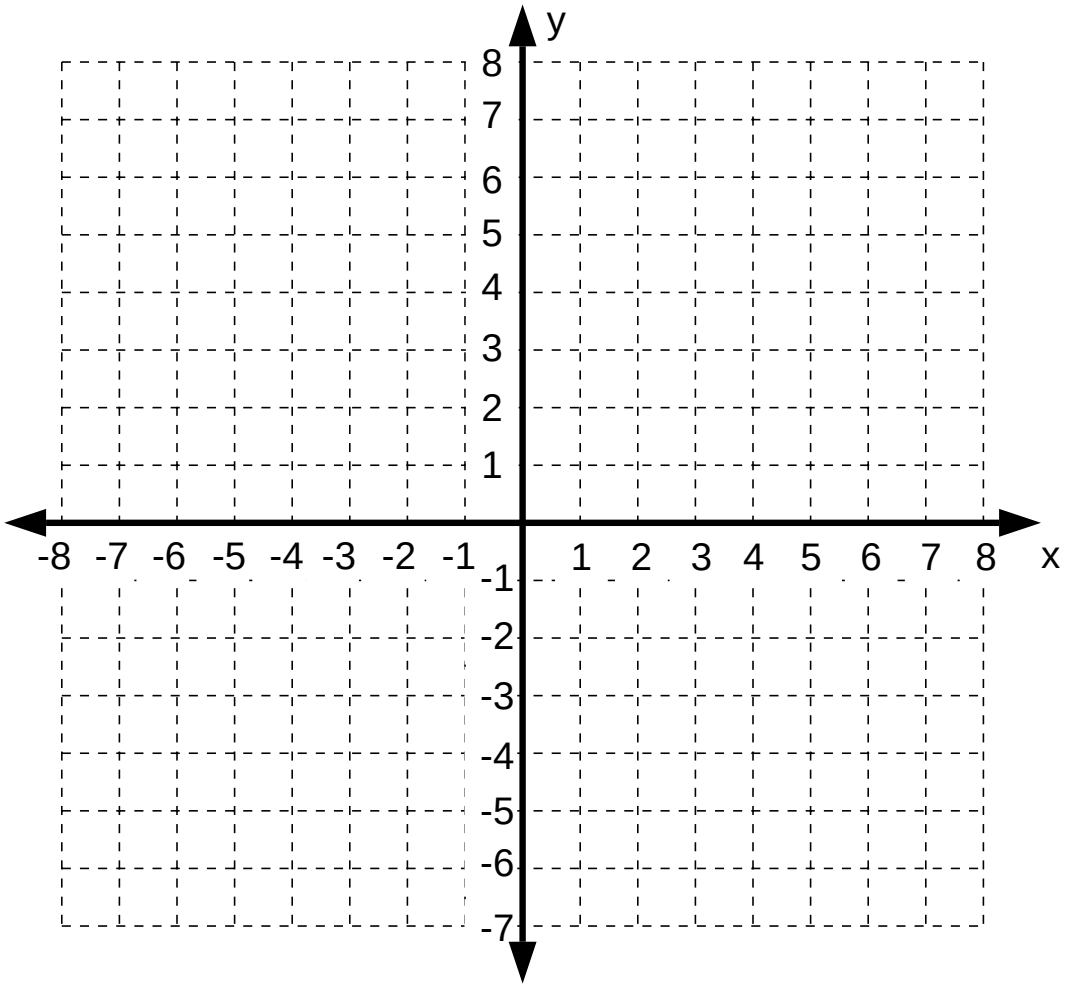
F.2a. What's the slope?

F.2b Does the graph rise or fall from left to right?

F.2c What's the y-intercept?

F.2d What's the x-intercept?

F.2e Now, graph the equation on the following graph.



F.3 Solve the following simultaneous equations algebraically first, and then graphically on the following graph. (10 points)

$$y = x + 2$$
$$y = -2x + 2$$