Integrated Honors
2.3 Notes

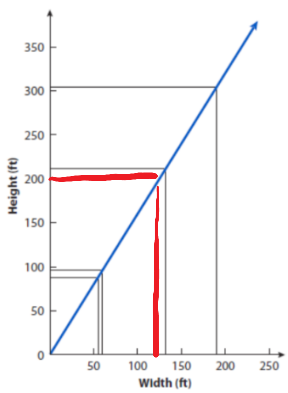
Direct Proportion: *One quantity is directly proportional to another if the ratios of the two quantities are constant.
*A graph of the quantities is a line that includes (0,0).
*Equation $y = kx$ "y is directly proportional to x"
"y varies directly with x"

Function: *A function is a relationship between input and output in which each input value has exactly one output value
*Provides a way of finding a unique output value for every possible input value.

Example 1: 8/5

a.) Use the regulating line for the Notre Dame proportioning system to estimate the width of a similar rectangle with a height of 200 feet.

≈ 120 ft



b.) Use a proportion to calculate the width.

$\frac{h}{w}$ $\frac{8}{5} = \frac{200}{w}$ $8w = 1000$ $w = 125$ ft

Example 2: The table shows the cost of having various amounts of clothes washed at a drop-off laundry.

Weight of Clothes (lb)	Cost ($)
4	5.20
6	7.80
9	11.70
13	16.90

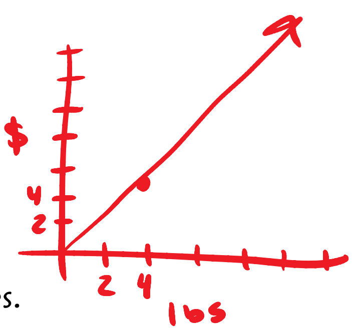
$\frac{5.20}{4} = 1.3$ $\frac{11.7}{9} = 1.3$ $\frac{7.80}{6} = 1.3$ $\frac{16.9}{13} = 1.3$

a.) Verify that cost is directly proportional to weight. yes = 1.3

b.) Write an equation that models cost C as a function of weight, w.

$\frac{C}{w} = 1.3$ $C = 1.3w$

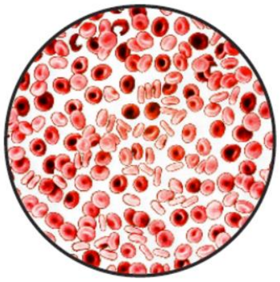
c.) Draw a graph of cost vs. weight.



d.) Use your equation to determine the cost for a load of 8 pounds of clothes.

$C = 1.3w$ $C = 1.3(8)$ $C = \$10.40$

Example 3: A person's red blood cell count can be estimated by looking at a drop of blood under a microscope. The number of cells inside the circular field of the microscope is counted.



$N = 2300A$

If the area of the circle is known, then area can be used as a measure of the number of blood cells. The number of cells varies directly with area.

a. Assume that a 0.01 mm^2 viewing field contains 23 red blood cells. Find an equation for the number N of red blood cells as a function of area A.

b. Use your equation from Part (a) to determine how many red blood cells are contained in an area of 50 mm^2.

$N = kA$ $N = 23, A = 0.01$

$23 = k(0.01)$

$2300 = k$

$N = 2300(50)$

$N = 115{,}000$ blood cells