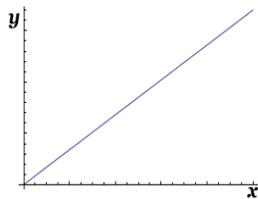


Name _____

College Math - Section 07 - Quiz 2, Fall 2010 [Shaw]

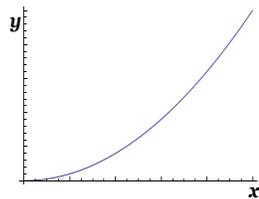
1. A certain door, during the winter, is about 4 inches thick. During the summer, the door swells with the heat to reach 4.2 inches thick. What is the percent change in the thickness of the door? [5 points]
2. Hugo went to the North Face store to buy a winter parka for his coming move to Chicago. Sales tax in his Florida town was 10.1%, and the amount he paid at checkout was \$330.30. What was the pre-tax sticker price for the coat? [5 points]
3. The frequency and wavelength of a sound wave are *inversely proportional* to each other. Suppose that one wave has a frequency of 1GHz and wavelength of 300,000 meters; if a second wave has frequency 5GHz, what is its wavelength? [5 points]
4. After spending a long time on a desert island without regular access to food, Kate's weight went from 135 lbs to a gaunt 110 lbs. What was the percent change in her body weight? [5 points]
5. Claire is stocking up on peanut butter. She buys 12 jars, each marked at \$2; her final checkout total for the peanut butter is \$26.40. What was the sales tax charged on her purchase? [5 points]



Direct

$$y = kx$$

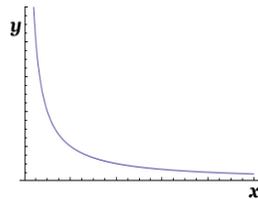
$$\frac{y}{x} = k$$



Direct to the square

$$y = kx^2$$

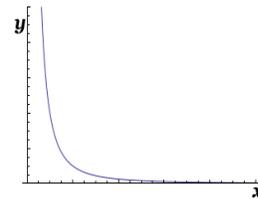
$$\frac{y}{x^2} = k$$



Inverse

$$y = \frac{k}{x}$$

$$x \cdot y = k$$



Inverse square

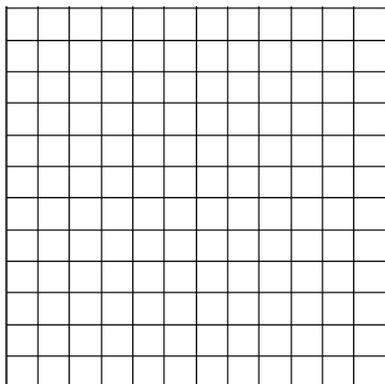
$$y = \frac{k}{x^2}$$

$$x^2 \cdot y = k$$

6. Using your calculator or by hand, (i) sketch the graph of the data in the two tables above. Then, for each table, (ii) use the chart below to determine which one of the four statistical relationships we discussed in class is exhibited by the data, and (iii) solve one of the pairs of points for the value of k and display the equation that relates the points. [10 points for each data set]

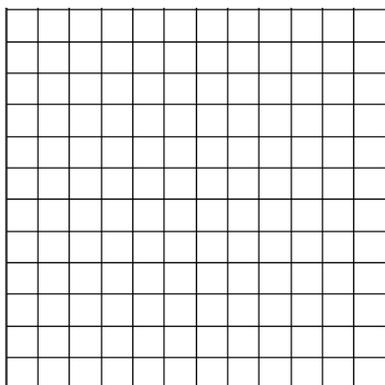
(a)

x	y
2	5
3	7.5
5	12.5
7.5	18.75
8	20



(b)

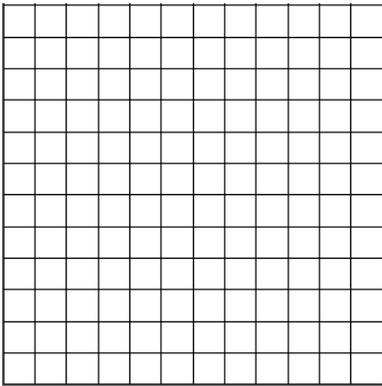
x	y
0.5	4
1.1	1.82
3.2	0.63
4.3	0.47
5	0.4



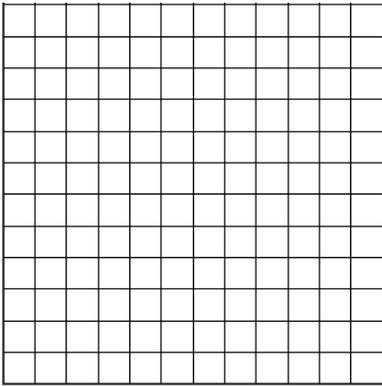
7. Given a fixed annual salary, a person's hourly income is *inversely proportional* to the number of hours that he or she must work to maintain that annual salary. Suppose that Mikhail and Ben each earn the same annual salary in the year 2010. Ben earned \$120 per hour and worked 40 hours per week, while Mikhail earned \$100 per hour. How many hours per week did Mikhail work to earn the same annual salary as Ben? [5 points]

8. Solve the following two equations for x by *graphing*. Sketch a picture of the graph, as well as showing the final answer. Be sure to check each of the graphs for multiple solutions; if there are more than one, you must list all of them. [10 points each]

(a) $x^2 - 2x - 2 = 0$



(b) $x - \sqrt{x} = 1$

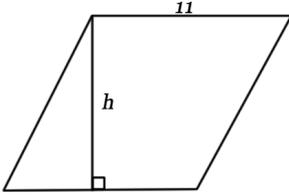


9. A car rental company charges its clients a fee of \$50.00 per day of usage, with an additional fee of \$0.17 per mile. You would like to rent a car for one day, and you have \$90 to spend on the car rental. What is the maximum number of miles you can afford to drive? [5 points]

10. A circular horse pen on a farm has a fence running around the entire circular border. If the fence measures 900 yards around, what is the diameter of the horse pen? Recall the formulas for area (A) and circumference (C) of a circle: [5 points]

$$A = \pi r^2 \quad C = 2\pi r$$

11. Suppose that the area of the parallelogram below is equal to 77 cm^2 . What is the height h of the parallelogram? Recall that the area of a parallelogram is given by the formula $A = bh$. [5 points]



12. Stranded on an island, Charlie asks Sawyer to give him some of the food he's hoarding. Sawyer tells Charlie that if he can guess how many cans of food he has, he'll give Charlie one. As a hint, Sawyer says, "Each of the cans is 7 inches tall, and if I stacked them up on top of each other, the pile would measure $14.58\bar{3}$ feet high." How many cans were there in Sawyer's stash? [5 points]

13. In each of the two right triangles below, use the Pythagorean Theorem to find the length of the side labeled x . Be sure to write down the equation first, and then solve by any method you like. [5 points each]

