

Honors Algebra II/Trig - NASH
1.3 Worksheet

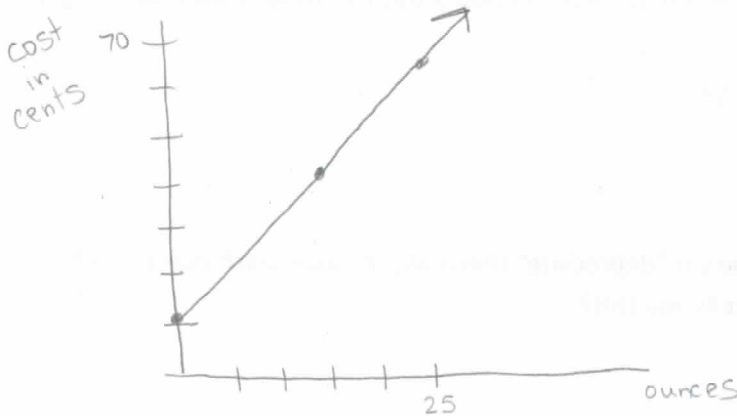
Name Key

1. Handy Andy sells 23 oz. cans of ranch style beans for 63 cents and 15 oz. cans for 45 cents. Assume that the price varies linearly with the number of ounces.

a. Write the particular equation expressing number of cents in terms of number of ounces.

$$\begin{matrix} (23, 63) \\ (15, 45) \end{matrix} \quad m = \frac{63-45}{23-15} = \frac{18}{8} = 2.25 \quad \begin{matrix} y-63 = 2.25(x-23) \\ y = 2.25x + 11.25 \end{matrix}$$

b. Sketch the graph.



c. A 52 oz. can costs \$1.39. According to your model, is this can over-priced or underpriced? By how much?

$$\begin{aligned} y &= 2.25(52) + 11.25 \\ &= 128.25 \text{ cents} \\ &= \$1.28 \end{aligned}$$

overpriced by
11¢

d. Suppose than an "individual serving" can was priced at 21 cents. About how many ounces would you expect to get?

$$21 = 2.25x + 11.25$$

$$9.75 = 2.25x$$

$$4.3 = x$$

ounces

2. Suppose you own a car that is presently 40 months old. From an automobile dealer's "Blue Book" you find that its present trade in value is \$3300. From an old Blue Book, you find that its trade in value 10 months ago was \$4700. Assume that its trade in value decreases linearly with time.

- a. Write the particular equation expressing trade in value of your car as a function of its age in months.

$$\begin{matrix} (40, 3300) \\ (30, 4700) \end{matrix}$$

$$m = \frac{4700 - 3300}{30 - 40} = -140$$

$$\begin{aligned} y - 3300 &= -140(x - 40) \\ y &= -140x + 8900 \end{aligned}$$

- b. You plan to get rid of the car when its trade in value drops to \$1000. How much longer can you keep the car?

$$1000 = -140x + 8900$$

Keep 16 more months

$$-7900 = -140x$$

$$56.4 = x$$

months

- c. By how many dollars does the car "depreciate" (decrease in value) each month? What part of the mathematical model tells you this?

$$\begin{aligned} &\$140/\text{month} \\ &\text{slope} \end{aligned}$$

- d. When do you predict the car will be worthless? What part of the mathematical model tells you this?

$$0 = -140x + 8900$$

$$140x = 8900$$

x-intercept

$$x = 63.6 \text{ mo}$$

- e. According to your linear model, what was the trade in value when the car was new? The car actually cost \$10,560 when it was new. How do you explain the difference between this number and the answer above?

The trade in value was \$10,560

Dealer profit