

## Worksheet 1.5: Linear Functions

**Problem 4.** In 2001, a 256 MB USB flash drive cost \$157. In 2017, a pack of ten 256 MB USB flash drives can be purchased for \$23. Assuming the value of a flash drive has depreciated linearly with time, write a formula giving the cost of a single 256 MB USB flash drive as a function of the number of years since 2001. (For this problem you can assume that you don't get any special discount for purchasing ten instead of one.)

The price of one flash drive in ~~2001~~ <sup>2017</sup> is ~~23~~  $\$ \frac{23}{10}$

The price of one in 2001 is \$157 (y-int)

$$m = \frac{157 - 2.3}{0 - 16} \quad b = 157 \quad y = \frac{-154.7}{16}x + 157$$

**Problem 5.** Tim sells self-printed Husker t-shirts outside Memorial Stadium on game days. He gets fined \$100 per game for trademark infringement, but as long as sells enough t-shirts, he doesn't care. It costs him \$7.50 to make each shirt, and he sells his shirts for \$20 each.

- a) Let  $R(x)$  represent Tim's revenue from selling  $x$  t-shirts on a particular game day, and let  $C(x)$  represent Tim's costs for the day if he sells  $x$  shirts. Write formulas for  $R(x)$  and  $C(x)$ .

- b) Recall that profit is revenue minus cost. Write a formula for  $P(x)$ , Tim's profit after selling  $x$  shirts on game day.

- c) Interpret the slope,  $x$ -intercept, and  $y$ -intercept of  $P(x)$  in the context of the problem.

- d) How many shirts must Tim sell in order to make a \$50 profit?