

(3K)

1. An air conditioning salesperson receives a base salary of \$3000 per month plus a commission. The commission is 2% of the sales up to and including \$25,000 for the month and 5% of the sales over \$25,000 for the month. (25K)

- a. Write a piecewise function that relates the salesperson total monthly income based off of his/her sales for the month.
 b. Sketch an accurate graph of this piecewise function. (Y3K)
 c. Determine the salesperson's monthly income if his/her sales were \$43,000 for the month.

← Better piecewise

(a)

$$S(x) = \begin{cases} 0.02x + 3, & 0 \leq x \leq 25 \\ 0.05x + 3, & x > 25 \end{cases}$$

$$\frac{0.02}{100} = \frac{2}{100} = \frac{1}{50}$$

$$\frac{0.05}{100} = \frac{5}{100} = \frac{1}{20}$$

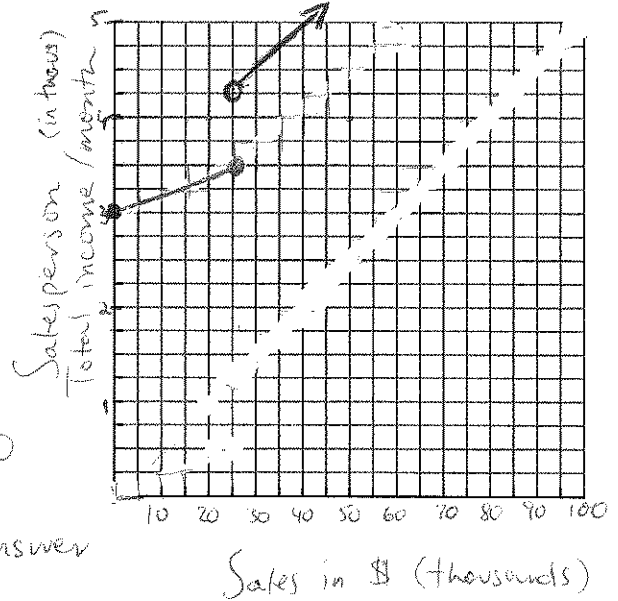
(c)

$$S(x) = 0.05x + 3$$

$$S(43) = 0.05(43) + 3$$

$$= 2.15K = \$2,150$$

$$\underbrace{3,000}_{\text{base salary}} + \underbrace{2,150}_{\text{commission}} = \boxed{\$5,150} \rightarrow \text{Final answer}$$



(b)

2. A certain country taxes the first \$20,000 of an individual's income at a rate of 15%, and all income over \$20,000 is taxed at 20%. (20K)

- a. Al makes \$16,000. Betty makes \$36,000. How much is each taxed? (16K) (36K)
 b. Write a piecewise function T that specifies the total tax on an income of x dollars.
 c. Make a graph of T. Be sure to plot the points from part a!
 d. Catina is taxed \$5000. What is her income? (5K)

(a)

$$\text{Al: } \$16,000 \cdot 0.15 = \$2,400$$

$$\text{Betty: } \$36,000 \cdot 0.20 = \$7,200$$

(b)

$$T(x) = \begin{cases} 0.15x, & 0 \leq x \leq 20 \\ 0.20x, & x > 20 \end{cases}$$

total tax on income of x \$s

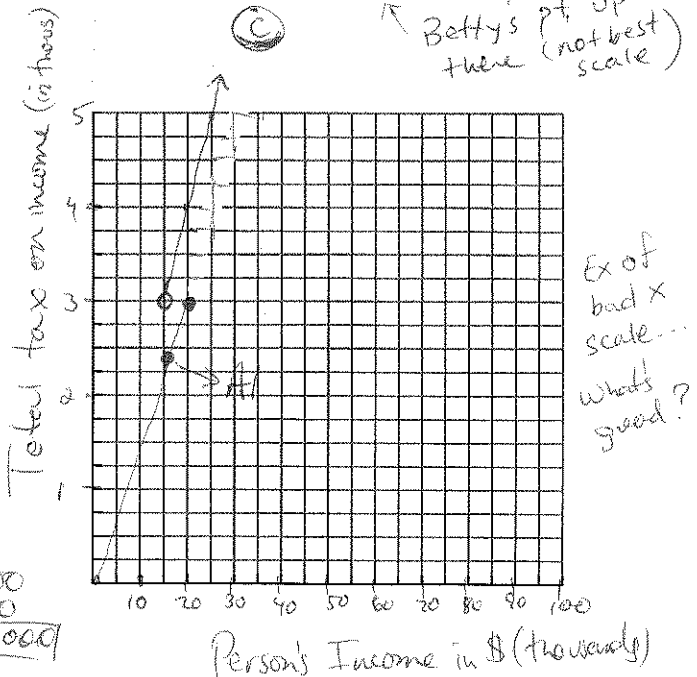
(d) At threshold of 20K, we have:

$$\text{Catina made } \$25,000$$

$$0.20x = 5000$$

$$x = \frac{5000}{0.20} = 25,000$$

\$20,000 * 0.15 = \$3,000 in taxes
 So Catina got taxed \$5,000, meaning she made more than 20K.



y-int: 0

$$\frac{15}{100} = \frac{3}{20}$$

$$\frac{20}{100} = \frac{1}{5}$$