1. An air conditioning salesperson receives a base salary of $2850 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.
   a. Write a piecewise function that relates the salesperson total monthly income based off or his/her sales for the month.
   b. Sketch an accurate graph of this piecewise function
   c. Determine the salesperson’s monthly income if his/her sales were $43,000 for the month.

\[ S(x) = \begin{cases} 0.02x + 2850 & 0 \leq x \leq 25000 \\ 0.05x + 2100 & x > 25000 \end{cases} \]

\[ 3400 = 0.05(26000) + b \]
\[ 3400 = 1300 + b \]
\[ b = 2100 \]

\[ S(25000) = 0.02(25000) + 2850 = \$4250 \]

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%.
   a. Al makes $16,000. Betty makes $36,000. How much is each taxed?
   b. Write a piecewise function $T(x)$ 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?

\[ T(x) = \begin{cases} 0.15x & 0 \leq x \leq 20000 \\ 0.2x - 1000 & x > 20000 \end{cases} \]

\[ 5000 = 0.2x - 1000 \]
\[ 6000 = 0.2x \]
\[ x = \$30000 \]

3. A paperback sells for $12. The author is paid royalties of 10% on the first 10,000 copies sold, and 15% on any additional copies.
   a. When the 6,000th book is sold, how much will the author earn on that sale?
   \[ \$12 \times 0.10 = \$1.20 \]
   b. When the 12,000th book is sold, how much will the author earn on that sale?
   \[ \$12 \times 0.15 = \$1.80 \]
   c. Let $x$ be the number of copies sold. Write a piecewise function for $R$ (the royalty payment earned on that sale) in terms of $x$.
   \[ R(x) = \begin{cases} 1.2x & 0 \leq x \leq 10000 \\ 1.8x - 6000 & x > 10000 \end{cases} \]

\[ 3000 = 1.5(x - 6000) \]
\[ 36000 = 1.5x \]
\[ x = 20,000 \text{ copies} \]