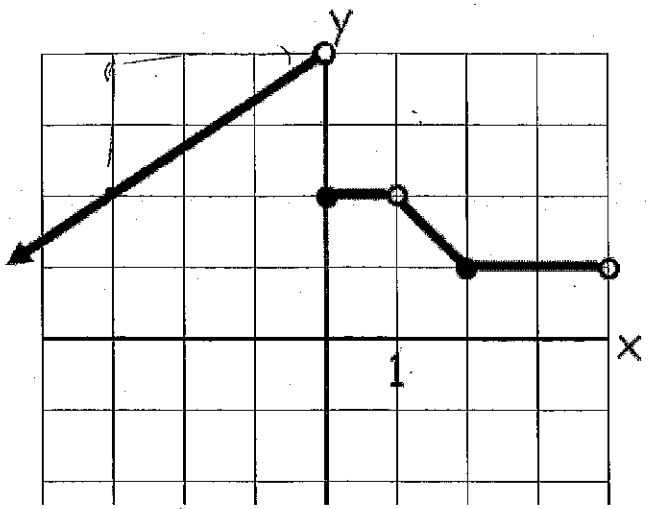
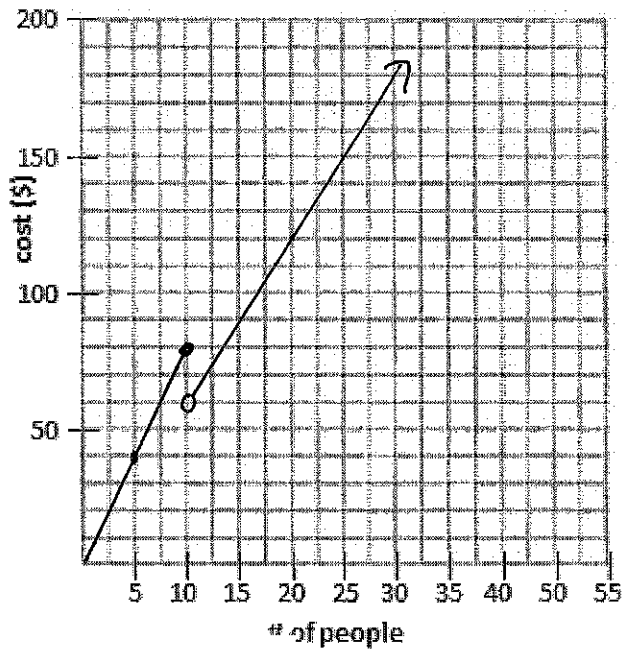
Directions: Please write a functions for the piecewise graph below. Hint: It is in 4 pieces.



$$f(x) = \begin{cases} \frac{2}{3}x + 4, & x < 0 \\ 2, & 0 \le x < 1 \\ -x + 3, & 1 < x \le 2 \\ 1, & 2 \le x < 4 \end{cases}$$

The movie theater charges admission to groups according to the following policy. Groups of less than or equal to 10 people are charged a rate of $8.00 per person, while groups of more than 10 people are charged a reduced rate of $6.00 per person.

a) Sketch the graph of the function.



b) If I bring all of my friends to the movies (all nine of them), we would pay the 10 person movie rate. We could bring other people for free if we paid the other reduced rate. How many extra people could we get in the movies for free based on the new rate? Would the final price be the same, less, or more than the 10 person rate? By how much?

$(10)(8) = \$80$ You would save $20

$(10)(6) = \$60$

c) Can you write a mathematical model expressing the amount a group will be charged for admission as a function of the number of people in the group. Let C(x) = cost and x = number of people.

$$C(x) = \begin{cases} 8x, & x \le 10 \\ 6x, & x > 10 \end{cases}$$