

Piecewise Application Notes

1. An amusement park charges \$100 for groups of 10 or less people. For groups of more than 10 they charge the \$100 fee plus an additional \$4 per person. The park does not allow groups larger than 40.
- a. A group of 15 would pay: 120 b. A group of 20 would pay: 140

Let $x =$ # of people

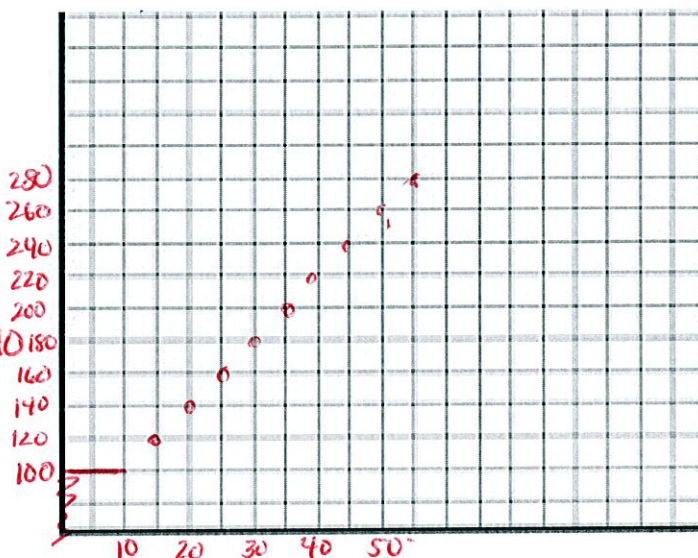
- c. Write a piecewise function $C = f(x)$, that represents the cost as a function of the number of people going to the amusement park.

Dotted because x represents a person.

Graph the function:

Label axes.

$$f(x) = \begin{cases} 100 & 0 < x \leq 10 \\ 4(x-10) + 100 & 10 < x \leq 40 \end{cases}$$

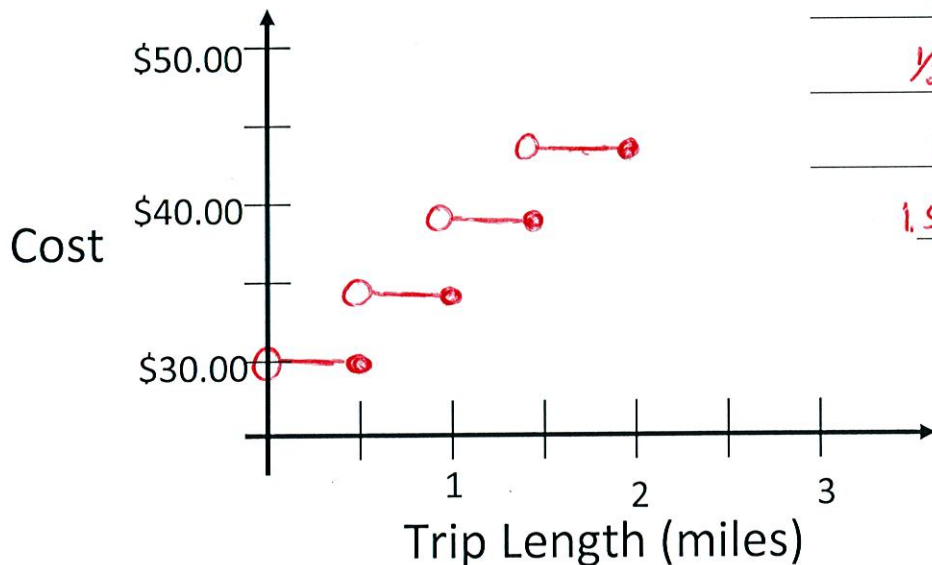


2. An uber in Los Angeles costs \$30.00 for the first half mile and then \$5.00 for each additional half mile. The taxis round up to the next half-mile. (So someone on a 1.2 mile ride would be charged for 1.5 mile: $\$30.00 + 2(5.00) = \40.00)

a. Finish the table

b. Graph the function:

Length of Ride	Cost
$0 < x \leq \frac{1}{2}$	<u>30.00</u>
$\frac{1}{2} < x \leq 1$	<u>35.00</u>
$1 < x \leq 1.5$	<u>40.00</u>
$1.5 < x \leq 2$	<u>45.00</u>



3. A cellphone charges \$1.50 for each 5 minutes of use of extra data to 30 minutes in length and \$5.00 for each additional minute.

- a. Use bracket notation to write a formula for the cost, C , of the data use as a function of its length time, t , in minutes.

$$C(x) = \begin{cases} 1.5 \left[\frac{x}{5} \right] & 0 < x \leq 30 \\ 5(x-30) + 9.00 & x > 30 \end{cases}$$

- b. How much does it cost for 10 minutes? \$3.00 55 minutes? \$134.00

4. A company charges \$200 a month to organize a company's payroll for up to 20 employees and an additional \$100 a month for each 20 employees over 20. Find a function, $P = f(x)$, that gives the payroll amount for 100 employees in one month.

$$f(x) = \begin{cases} 200 & 0 < x \leq 20 \\ 300 & 20 < x \leq 40 \\ 400 & 40 < x \leq 60 \\ 500 & 60 < x \leq 80 \\ 600 & 80 < x \leq 100 \end{cases}$$

5. An economy car costs \$95 per week. Extra days cost \$24 per day until the rate exceeds the weekly rate, in which case the weekly rate applies. Find the cost C of renting an economy car as a piecewise-defined function of the number x of days used, where $7 \leq x \leq 14$

$$C(x) = \begin{cases} 95 & x = 7 \\ 24(x-7) + 95 & 7 < x \leq 10 \\ 190 & 11 \leq x \leq 14 \end{cases}$$