

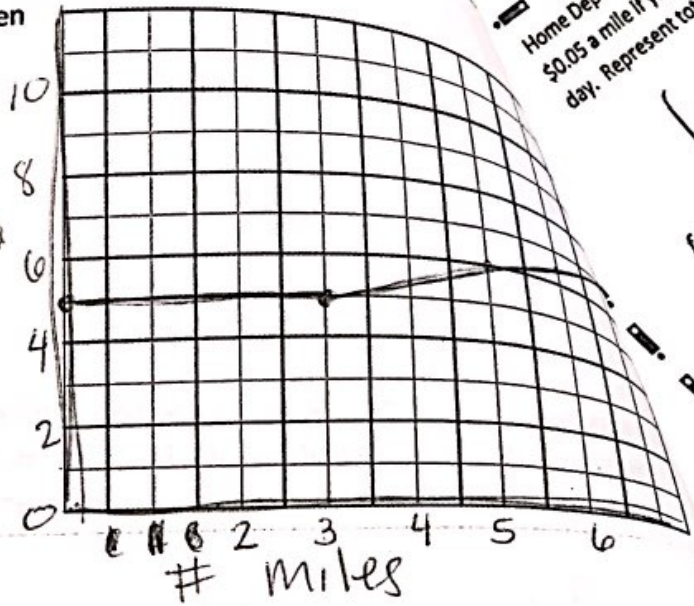
# WRITING PIECEWISE FUNCTIONS

For each, write a piecewise function to represent the situation. Be sure to define the variable. Attach when the graph paper is present.

1. A taxi charges \$5 minimum to ride up to 3 miles and then charges \$0.50 for each mile beyond 3. Represent the total cost.  $x = \# \text{ miles}$

$$f(x) = \begin{cases} 5 & 0 \leq x \leq 3 \\ 0.5x + 3.5 & x > 3 \end{cases}$$

$5 + .5(x-3)$



A taxi charges \$5  
charges \$0.50  
total cost

Home Depot charges \$20 a day plus \$0.15 per  
\$0.05 a mile if you drive over 10 miles a da  
day. Represent total cost.  $x = \#$

$$f(x) = \begin{cases} 20 \\ 20 + .15x \end{cases}$$

A store charges \$15 per t-shirt for orders of 50 or fewer t-shirts, \$13.50 per t-shirt for orders of 75 or fewer but more than 50 t-shirts, and \$12.50 per t-shirt for orders of more than 75 t-shirts. Represent the total cost.

$x = \# \text{ t-shirts}$

$$f(x) = \begin{cases} 15x & 0 \leq x \leq 50 \\ 13.5x & 50 < x \leq 75 \\ 12.5x & x > 75 \end{cases}$$

The postal service charges \$1.95 for a package up to 4 ounces and \$0.17 for each additional ounce up to 13 ounces. Represent the total cost.  $x = \text{weight (ounces)}$

$$f(x) = \begin{cases} 1.95 & 0 \leq x \leq 4 \\ 0.17x + 1.27 & 4 < x \leq 13 \end{cases}$$

$$1.95 + .17(x-4)$$

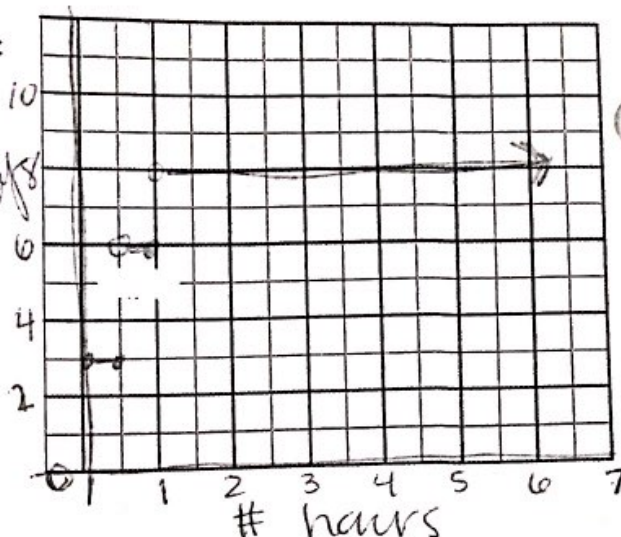
$$1.95 + .17x - .68$$

$$.17x + 1.27$$

Parking garage charges \$3 per half hour to park. For each additional half hour (or portion of half hour), the charge is an additional \$3 until you reach \$8. Represent the total cost.

$x = \#$  hours parked

$$f(x) = \begin{cases} 3 & 0 \leq x \leq 0.5 \\ 6 & 0.5 < x \leq 1 \\ 8 & 1 < x \leq 2.4 \end{cases}$$

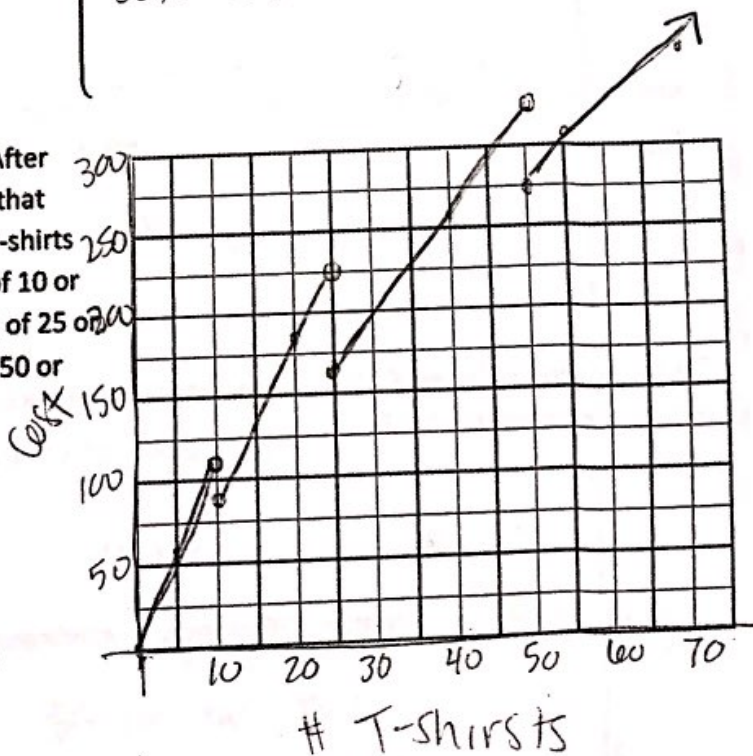


5. A horseback riding stable charges by the hour. The rate for the first hour is \$25, each hour or portion of an hour thereafter costs an additional \$15.00. There is a four hour maximum. If you keep the horse out more than 5 hours, the price increases by \$50 an hour. Represent cost per hour then rewrite representing total cost.

$$f(x) = \begin{cases} 25 & 0 \leq x \leq 1 \\ 25 + 15(x-1) & 1 < x \leq 5 \\ 85 + 50(x-5) & x > 5 \end{cases} \quad f(x) = \begin{cases} 25 & 0 \leq x \leq 1 \\ 15x + 10 & 1 < x \leq 5 \\ 50x - 105 & x > 5 \end{cases}$$

6. A school club is looking to buy t-shirts to sell. After much investigating, the club found a company that offered a discount based on quantity orders. T-shirts cost \$11 each for orders less than 10. Orders of 10 or more but less than 25 are \$9 per t-shirt, orders of 25 or more but less than 50 are \$6.50, and orders of 50 or more are \$5.50 each. Represent total cost.

$$f(x) = \begin{cases} 11x & 0 \leq x < 10 \\ 9x & 10 \leq x < 25 \\ 6.5x & 25 \leq x < 50 \\ 5.5x & 50 \leq x \end{cases}$$



How many shirts should I order if I need 9 t-shirts?

7. Home Depot charges \$20 a day plus \$0.15 per mile to rent a pick-up truck. Home Depot offers a discount of \$0.05 a mile if you drive over 10 miles a day. Or they offer a discount of \$0.10 a mile if you drive over 20 miles a day. Represent total cost.  $x = \# \text{miles/day}$

$$f(x) = \begin{cases} 20 + .15x & 0 < x \leq 10 \\ 20 + .10x & 10 < x \leq 20 \\ 20 + .05x & 20 < x \end{cases}$$

8. You have a summer job that pays time and a half for overtime. That is, if you work more than 40 hours per week, your hourly wage for the extra hours is 1.5 times your normal hourly wage of \$7. Represent total wage.  $x = \# \text{hrs}$

$$f(x) = \begin{cases} 7x & 0 \leq x \leq 40 \\ 280 + 10.5(x-40) & 40 < x \end{cases}$$

How much will you get paid if you work 45 hours?  
\$332.50

9. The pay structure at a parking garage is \$3 per hour for the first 4 hours. For any number of hours parked after 4 hours, it costs \$2 per hour to park. Represent total cost.  $x = \# \text{hrs}$

$$f(x) = \begin{cases} 3x & 0 < x \leq 4 \\ 12 + 2(x-4) & x > 4 \end{cases}$$

10. The function below shows the week day parking charges of a parking lot. Describe the scenario if  $x$  represents the number of hours parked.

$$f(x) = \begin{cases} 5x, & x \leq 3 \\ 10, & x > 3 \end{cases}$$

It costs \$5/hr for the first 3 hrs.  
After 3 hrs, it is a flat rate of \$10

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12. Part of the amount of Social Security tax (FICA) you pay depends on your annual income. As of 2006, you pay 6.2% of your income if it is less than \$94,200. If your income is at least \$94,200, you pay a fixed amount of \$5840.40. Represent total tax paid.

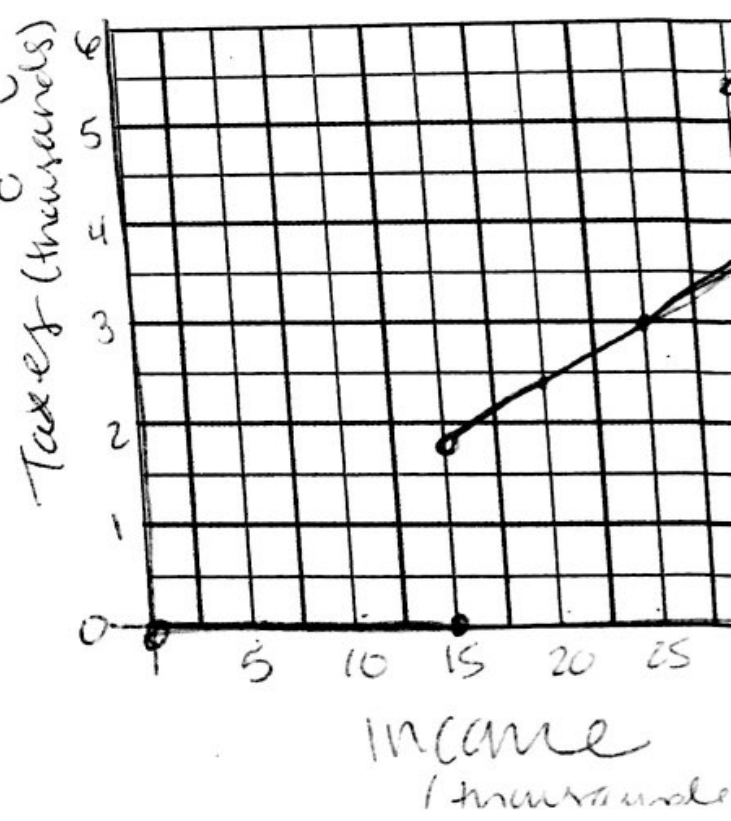
$x = \text{income}$

$$f(x) = \begin{cases} 0.062x & 0 < x < 94,200 \\ 5,840.40 & x \geq 94,200 \end{cases}$$

13. In a certain country, income tax is assessed as follows: There is no tax on income up to \$15,000 and \$30,000 is taxed at 12%. Income over \$30,000 is taxed at 18%. Represent percent taxed.

$x = \text{income}$

$$f(x) = \begin{cases} 0 & 0 < x \leq 15,000 \\ 0.12x & 15,000 < x \leq 30,000 \\ 0.18x & x > 30,000 \end{cases}$$



... to ride up to 3 miles and then  
... mile beyond 3. Represent the

... able first. Provide a

... shop charges an initial fee of \$20 to create the silk screen. The price per shirt is \$17 for orders of  
... and \$15.80 per shirt for orders of more than 50 shirts. Represent the total cost.

$x = \# \text{ shirts}$

$$f(x) = \begin{cases} 20 + 17x & 0 \leq x \leq 50 \\ 20 + 15.80x & 50 < x \end{cases}$$

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