

Each problem is worth 5 points. For full credit provide proper justification for your answer.

1. If the monthly charge for garbage collection by a certain company is \$18 for 50 pounds of garbage and \$24 for 100 pounds of garbage, find a linear function that represents the monthly charge for collecting  $x$  pounds of garbage.

$50 \rightarrow \$18$  pt(50,18)  $x \rightarrow$  lbs of garbage  
 $100 \rightarrow \$24$  pt(100,24)  $y \rightarrow$  charge Great

For every  $x$  lbs of garbage, it costs  $y$  dollars.

$$\text{Slope} = m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{24 - 18}{100 - 50} = \frac{6}{50} = \frac{3}{25}$$

$$y - y_1 = m(x - x_1) \quad \leftarrow \text{use point-slope form because we have a slope and either of two points.}$$

$$y - 18 = \frac{3}{25}(x - 50)$$

$$y - 18 = \frac{3}{25}x - 6$$

$$y = \frac{3}{25}x + 12$$

Excellent!

$$\text{charge} = \frac{3}{25} \cdot \# \text{ of lbs} + \$12 \text{ base cost.}$$

it seems awfully stupid, though, for this to be linear ~ why should you pay \$12 for having no garbage? ☹️

Good question!