Name: ___Solutions___

Directions: Show all work. No credit for answers without work.

1. [**5 points**] Rebecca receives a new tablet computer with 32 gigabytes of memory. The amount of unused memory M (in gigabytes) is a function of the time t (in months) that she has owned the device.

   (a) Translate the following into English: $M(16) = 20$. <u>Be sure to include units.</u>

   After 16 months, Rebecca's tablet has 20 GB of unused memory.

   (b) Translate the following into a mathematical equation: initially, the device comes loaded with 3 gigabytes worth of software and has only 29 gigabytes of unused space.

   $$M(0) = 29$$

2. [**5 points**] A linear function passes through the points $(2, 5)$ and $(-1, -3)$.

   (a) Find the equation of this linear function; express your answer in the form $y = mx + b$.

   $$m = \frac{5 - (-3)}{2 - (-1)} = \frac{8}{3}$$

   $$y - y_0 = m(x - x_0)$$

   $$y - 5 = \frac{8}{3}(x - 2)$$

   $$y = \frac{8}{3}x - \frac{16}{3} + 5$$

   $$\boxed{y = \frac{8}{3}x - \frac{1}{3}}$$

   (b) Find the vertical intercept (or y-intercept).

   Plug $x = 0$:

   $$y = \frac{8}{3} \cdot 0 - \frac{1}{3}$$

   $$\boxed{y = -\frac{1}{3}}$$

   (c) Find the horizontal intercept (or x-intercept).

   Plug $y = 0$:

   $$0 = \frac{8}{3}x - \frac{1}{3}$$

   $$0 = 8x - 1$$

   $$8x = 1$$

   $$\boxed{x = \frac{1}{8}}$$