2. (16 points) In each case below find a possible formula for the function described.

   (a) (4 pts.) Upon looking at her watch a student leaves behind a freshly made cappuccino in a study hall. The coffee is initially 92° F and cools at a rate of 2% per hour. The student knows that, if left there to cool forever, the cappuccino will eventually approach the temperature of the study hall which is 67° F.

   • $y = (92 - 67)(0.98)^t + 67$, or $y = 25(0.98)^t + 67$

   (b) (4 pts.) A sinusoidal function that fits the following table of values:

x	0	1.5	3	4.5	6
$s(x)$	100	300	500	300	100

   • $y = -200\cos\left(\frac{\pi}{3}x\right) + 300$

   (c) (3 pts.) The length, L in feet, of a scarf you are knitting is a *linear function* of the number of rolls, r, of yarn used to knit the scarf, and you know $L'(3) = 0.5$.

   • $L(r) = 0.5r$

   (d) (5 pts.) This rational function has only two zeros, $x = -2$ and $x = 3$. It has only one vertical asymptote at $x = 0$ and a horizontal asymptote of $y = 4$.

   • $y = \frac{4\ (x+2)(x-3)}{x^2}$