

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. If a cricket chirps 113 times per minute at  $70^{\circ}\text{F}$  and 173 chirps per minute at  $80^{\circ}\text{F}$ , find a linear equation that models the temperature as a function of the number of chirps per minute.

$$(113, 70) \quad \& \quad (173, 80)$$

$$\text{slope: } \frac{80-70}{173-113} \rightarrow \frac{10}{60} \rightarrow \frac{1}{6}$$

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

$$y - 70 = \frac{1}{6}(x - 113)$$

$$y - 70 = \frac{1}{6}x - \frac{113}{6} \rightarrow$$

$$y = \frac{1}{6}x + \frac{307}{6}$$

$$N = \frac{1}{6}T + \frac{307}{6}$$

Great

2. Find an exponential function of the form  $f(x) = Ca^x$  passing through the points (1,6) and (3,24).

$$b = Ca^1$$

$$\frac{b}{a} = \frac{Ca}{a}$$

$$c = \frac{b}{a}$$

$$24 = Ca^3$$

$$24 = \frac{b}{a}(a^3)$$

$$24 = ba^{-1}(a^3)$$

$$\frac{24}{b} = \frac{ba^2}{b}$$

$$4 = a^2$$

$$a = \pm 2$$

$$6 = C(2)^1$$

$$6 = C(2)$$

$$C = 3$$

$$f(x) = 3 \cdot 2^x$$

Nice  
Job!