1. ANSWER: 20 RPM

2. HINT: Recall that \( f(x) = y \iff x = f^{-1}(y) \). You want \( x = f^{-1}(5) \). So, set \( f(x) = 5 \) and solve for \( x \).
   ANSWER: \( f^{-1}(5) = -\frac{21}{2} \)

3. ANSWER: The domain is the set of all real \( x \) except \(-2\) and \(6\). The zeros are \(1\) and \(-3\). The \( y \)-intercept is \( \frac{1}{10} \). The lines \( x = -2 \) and \( x = 6 \) are the vertical asymptotes. The line \( y = \frac{2}{5} \) is the horizontal asymptote.

4. (a) HINT: \( \tan 25^\circ = \frac{96}{y} \) and \( \tan 70^\circ = \frac{96 + z}{y} \)
   ANSWER: \( y = 205.87 \) and \( z = 469.62 \)
   (b) HINT: \( \cos \alpha = \frac{4.2}{5} \) and \( \beta = \frac{\pi}{2} - \alpha \)
   ANSWER: \( x = 2.71, \alpha = 0.5735 \) radians, \( \beta = 0.9973 \) radians

5. (a) HINT: The hard one is the \( t \)-coordinate of point \( b \). Use the fact that there are six quarters of a period between points \( a \) and \( c \), whose \( t \)-coordinates are 24 hours apart. So, \( \frac{6}{4}(\text{period})=24 \), which means that the period is 16. Then there are three quarters of a period between point \( a \) and point \( b \).
   ANSWER: \( a = (3, 104.6), b = (15, 101.6), c = (27, 98.6) \)
   (b) ANSWER: \( A = 3, B = 16, C = 15, D = 101.6 \)
   (c) HINT: Set \( 100 = 3 \sin \left[ \frac{2\pi}{16} (t - 15) \right] + 101.6 \) and solve for \( t \). This gives \( t = 13.57 \). Use symmetry and the fact that the sine curve is hitting a low point at \( t = 11 \) to find that temperature is equal to 100° at \( t = 8.43 \). Adding one period to this time gives \( t = 8.43 + 16 = 24.43 \), the time when the temperature next drops below 24 hours. In the first 24 hours, Lisa’s temperature is above 100 from \( t = 0 \) to \( t = 8.43 \) and from \( t = 13.57 \) to \( t = 24 \).
   ANSWER: 18.86 hours

6. HINT: Write out the multi-part rule for \( f(x) \) first.
   ANSWER: \( f(x) + g(x) = \begin{cases} 0 & \text{if } x < -2 \\ -x - 2 & \text{if } -2 \leq x < 0 \\ x - 2 & \text{if } 0 \leq x \end{cases} \)}