1. (a) $\dfrac{ds}{dt} = t^{5/2} \cdot 3\left(4t^7 - t^{-4}\right)^2 \left(28t^6 + 4t^{-5}\right) + \left(4t^7 - t^{-4}\right)^3 \cdot \dfrac{5}{2}t^{3/2}$

   (b) $\dfrac{dy}{dx} = \dfrac{7}{3} \cdot (-5)\left(2x^3 + x\right)^{-6}\left(6x^2 + 1\right) + \dfrac{8}{11} \cdot 5\left(2x^3 + x\right)^4\left(6x^2 + 1\right)$

   (c) $\dfrac{dz}{dw} = 15\left(\dfrac{w^3 + 3w + 10}{w}\right)^{14}\left[\dfrac{w(3w^2 + 3) - (w^3 + 3w + 10)}{w^2}\right]$

2. (a) $\dfrac{f(7 + h) - f(7)}{h} \approx 1.17$

   (b) Three possible answers: $a \approx 1.8, 9.5$, or 23.5

   (c) Many possible answers. One is from $x = 9$ to $x = 14$.

   (d) from $x \approx 3$ to $x \approx 8$

3. (a) $\dfrac{R(a + h) - R(a)}{h} = 4a + 2h + 6$

   (b) $t = 28.25$ minutes

   (c) from $t = 0$ to $t = 12.75$ minutes

   (d) They are 975.375 feet apart, traveling at a rate of 57 feet per minute.

4. (a) from $q = 2$ to $q = 9$ hundred Things

   (b) $q = 12.35$ hundred Things

   (c) 2.85 dollars

   (d) $q = 7.2$ hundred Things