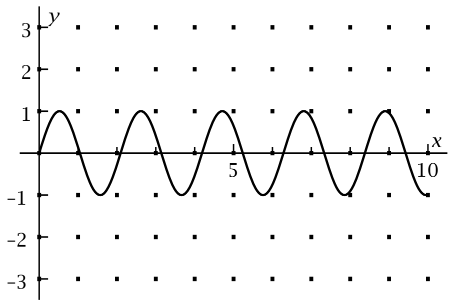
8. At 1 min, $x(60) \approx 81752$ ft (≈ 15.5 mi!).
   This does not seem reasonable; the data show the bullet to be slowing down more than the regression equation suggests.

9. Answers will vary.

Exploration 3-6a

1. Yes

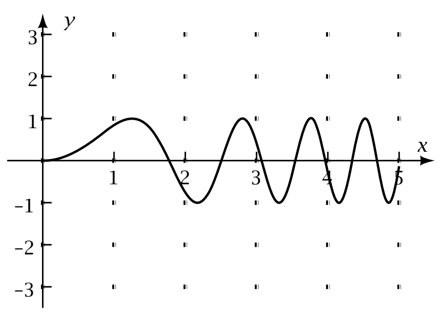
2.



3. Conjectures will vary.

4. $g'(x) = 3 \cos 3x$

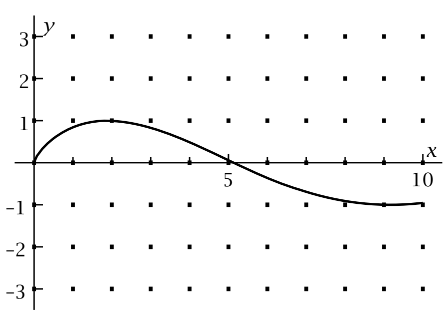
5.



6. $h'(x) = 2x \cos x^2$

7. Take the derivative of $\sin x^2$ and get $\cos x^2$. Then multiply by $2x$, the derivative of x^2.

8.

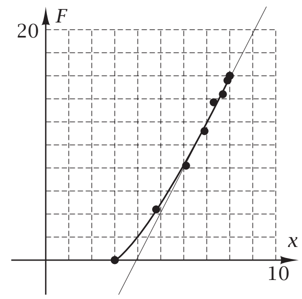


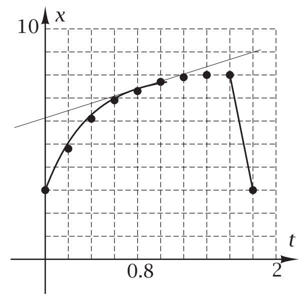
$t'(x) = 0.7 \cos x^{0.7}$

9. Answers will vary.

Exploration 3-7a

1.



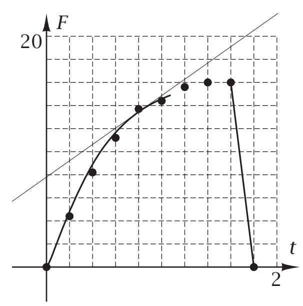


2. $\dfrac{dx}{dt}(0.8) \approx \dfrac{7.7 - 6.9 \text{ in.}}{1.0 - 0.6 \text{ s}} = 2$ in./s

3. $\dfrac{dF}{dx}(7.3) \approx \dfrac{14.4 - 11.2 \text{ oz}}{7.7 - 6.9 \text{ in.}} = 4$ oz/in.

4. See the graph in Problem 1, showing that lines through the respective points with the slopes as found in Problems 2 and 3 are tangent to the graphs.

5.



6. $\dfrac{dF}{dt} = \dfrac{dF}{dx} \cdot \dfrac{dx}{dt} = 4$ oz/in. $\cdot$ 2 in./s = 8 oz/s

7. $\dfrac{dF}{dt}(0.8) = \dfrac{14.4 - 11.2 \text{ oz}}{1.0 - 0.6 \text{ s}} = 8$ oz/s—same answer as in Problem 6!

8. See the graph in Problem 5. The line with slope 8 is tangent to the graph. (Observe the different scales for the two axes.)

9. Answers will vary.