Lesson 9 Practice Problems

1. Write each quadratic expression in standard form. Draw a diagram if needed.

   a. $(x + 4)(x - 1)$

   b. $(2x - 1)(3x - 1)$

2. Consider the expression $8 - 6x + x^2$.

   a. Is the expression in standard form? Explain how you know.

   b. Is the expression equivalent to $(x - 4)(x - 2)$? Explain how you know.

3. Which quadratic expression is written in standard form?

   A. $(x + 3)x$

   B. $(x + 4)^2$

   C. $-x^2 - 5x + 7$

   D. $x^2 + 2(x + 3)$

4. Explain why $3x^2$ can be said to be in both standard form and factored form.

5. Jada dropped her sunglasses from a bridge over a river. Which equation could represent the distance y fallen in feet as a function of time, t, in seconds?

   A. $y = 16t^2$

   B. $y = 48t$

   C. $y = 180 - 16t^2$

   D. $y = 180 - 48t$

   (From Unit 6, Lesson 5.)

6. A football player throws a football. The function h given by $h(t) = 6 + 75t - 16t^2$ describes the football's height in feet t seconds after it is thrown.

   Select **all** the statements that are true about this situation.

   A. The football is thrown from ground level.

   B. The football is thrown from 6 feet off the ground.

   C. In the function, $-16t^2$ represents the effect of gravity.

   D. The outputs of h decrease then increase in value.

   E. The function h has 2 zeros that make sense in this situation.

   F. The vertex of the graph of h gives the maximum height of the football.

   (From Unit 6, Lesson 6.)

7. *Technology required*. Two rocks are launched straight up in the air.

   - The height of Rock A is given by the function f, where $f(t) = 4 + 30t - 16t^2$.
   - The height of Rock B is given by function g, where $g(t) = 5 + 20t - 16t^2$.

   In both functions, t is time measured in seconds and height is measured in feet. Use graphing technology to graph both equations.

   a. What is the maximum height of each rock?

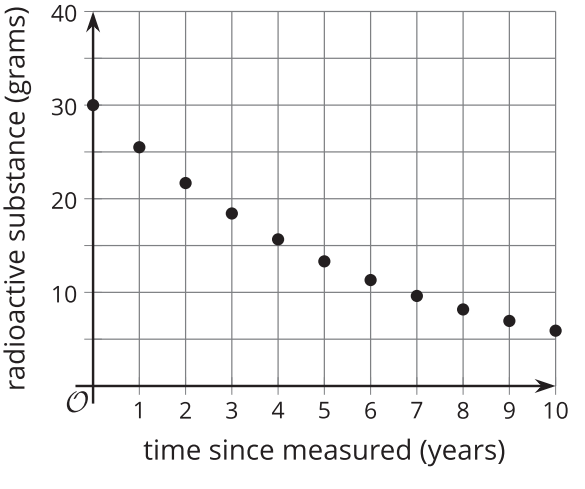
   b. Which rock reaches its maximum height first? Explain how you know.

   (From Unit 6, Lesson 6.)

8. The graph shows the number of grams of a radioactive substance in a sample at different times after the sample was first analyzed.

   a. What is the average rate of change for the substance during the 10 year period?

   b. Is the average rate of change a good measure for the change in the radioactive substance during these 10 years? Explain how you know.



(From Unit 5, Lesson 10.)

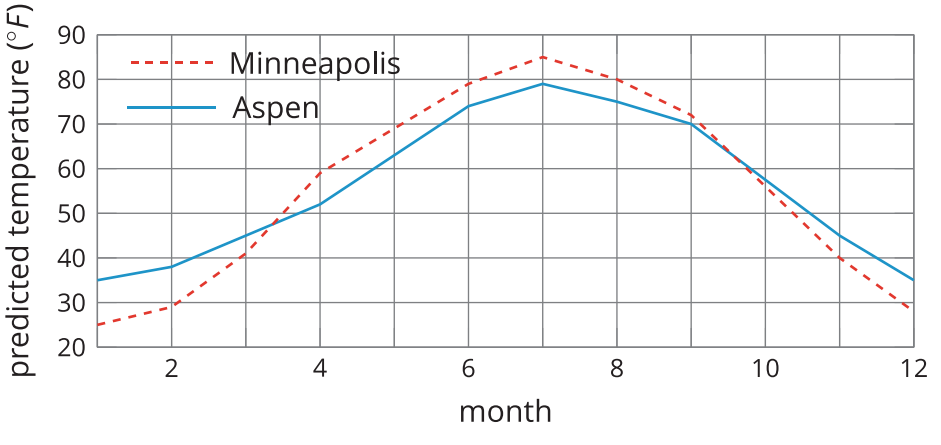
9. Each day after an outbreak of a new strain of the flu virus, a public health scientist receives a report of the number of new cases of the flu reported by area hospitals.

time since outbreak in days	2	3	4	5	6	7
number of new cases of the flu	20	28	38	54	75	105

Would a linear or exponential model be more appropriate for this data? Explain how you know.

(From Unit 5, Lesson 11.)

10. $A(t)$ is a model for the temperature in Aspen, Colorado, t months after the start of the year. $M(t)$ is a model for the temperature in Minneapolis, Minnesota, t months after the start of the year. Temperature is measured in degrees Fahrenheit.



a. What does $A(8)$ mean in this situation? Estimate $A(8)$.

b. Which city has a higher predicted temperature in February?

c. Are the 2 cities' predicted temperatures ever the same? If so, when?

(From Unit 4, Lesson 9.)