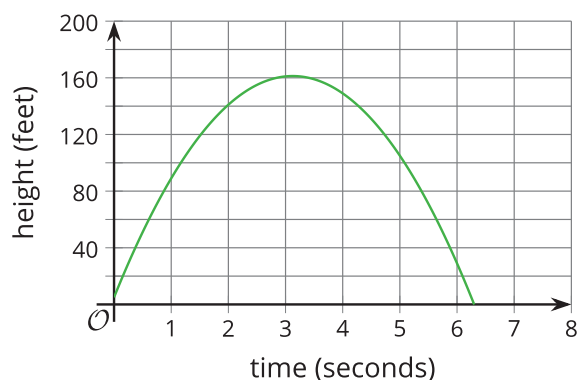# Lesson 5 Practice Problems

1. A rocket is launched in the air and its height, in feet, is modeled by the function h. Here is a graph representing h.

   Select **all** true statements about the situation.

   A. The rocket is launched from a height less than 20 feet above the ground.

   B. The rocket is launched from about 20 feet above the ground.

   C. The rocket reaches its maximum height after about 3 seconds.

   D. The rocket reaches its maximum height after about 160 seconds.

   E. The maximum height of the rocket is about 160 feet.

2. A baseball travels d meters t seconds after being dropped from the top of a building. The distance traveled by the baseball can be modeled by the equation $d = 5t^2$.

   a. Complete the table and plot the data on the coordinate plane.

t (seconds)	d (meters)
0	
0.5	
1	
1.5	
2	
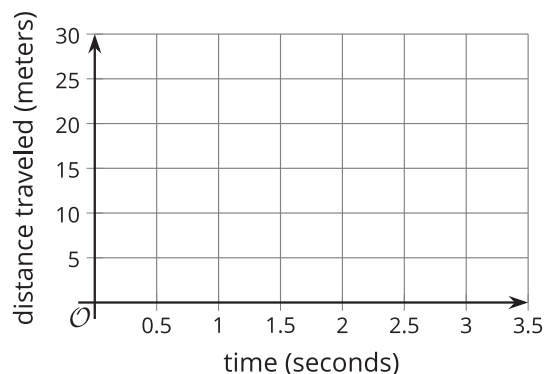
   b. Is the baseball traveling at a constant speed? Explain how you know.

3. A rock is dropped from a bridge over a river. Which table could represent the distance in feet fallen as a function of time in seconds?

Table A

time (seconds)	distance fallen (feet)
0	0
1	48
2	96
3	144

Table B

time (seconds)	distance fallen (feet)
0	0
1	16
2	64
3	144

Table C

time (seconds)	distance fallen (feet)
0	180
1	132
2	84
3	36

Table D

time (seconds)	distance fallen (feet)
0	180
1	164
2	116
3	36

A. Table A

B. Table B

C. Table C

D. Table D

4. Determine whether $5n^2$ or 3^n will have the greater value when:

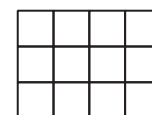a. $n = 1$

b. $n = 3$

c. $n = 5$

(From Unit 6, Lesson 4.)

5. Select **all** of the expressions that give the number of small squares in Step n.

Step 1 Step 2 Step 3

A. $2n$

B. n^2

C. $n + 1$

D. $n^2 + 1$

E. $n(n + 1)$
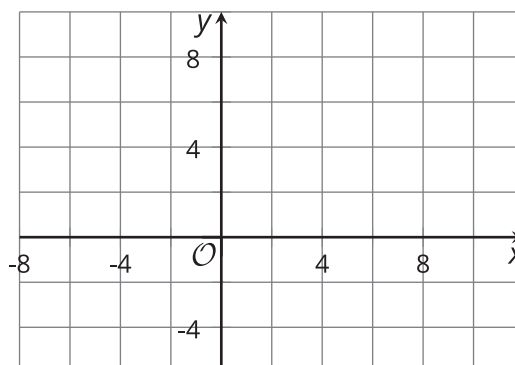
F. $n^2 + n$

G. $n + n + 1$

(From Unit 6, Lesson 3.)

6. A small ball is dropped from a tall building. Which equation could represent the ball's height, h, in feet, relative to the ground, as a function of time, t, in seconds?

A. $h = 100 - 16t$

B. $h = 100 - 16t^2$

C. $h = 100 - 16^t$

D. $h = 100 - \frac{16}{t}$

7. Use the rule for function f to draw its graph.

$$f(x) = \begin{cases} 2, & -5 \leq x < -2 \\ 6, & -2 \leq x < 4 \\ x, & 4 \leq x < 8 \end{cases}$$

(From Unit 4, Lesson 12.)

8. Diego claimed that $10 + x^2$ is always greater than 2^x and used this table as evidence.

Do you agree with Diego?

x	$10 + x^2$	2^x
1	11	2
2	14	4
3	19	8
4	26	16

(From Unit 6, Lesson 4.)

9. The table shows the height, in centimeters, of the water in a swimming pool at different times since the pool started to be filled.

a. Does the height of the water increase by the same amount each minute? Explain how you know.

minutes	height
0	150
1	150.5
2	151
3	151.5

b. Does the height of the water increase by the same factor each minute? Explain how you know.