

## Lesson 8 Practice Problems

1. Draw a diagram to show that  $(2x + 5)(x + 3)$  is equivalent to  $2x^2 + 11x + 15$ .

2. Match each quadratic expression that is written as a product with an equivalent expression that is expanded.

A.  $(x + 2)(x + 6)$

1.  $x^2 + 12x + 32$

B.  $(2x + 8)(x + 2)$

2.  $2x^2 + 10x + 12$

C.  $(x + 8)(x + 4)$

3.  $2x^2 + 12x + 16$

D.  $(x + 2)(2x + 6)$

4.  $x^2 + 8x + 12$

3. Select **all** expressions that are equivalent to  $x^2 + 4x$ .

A.  $x(x + 4)$

B.  $(x + 2)^2$

C.  $(x + x)(x + 4)$

D.  $(x + 2)^2 - 4$

E.  $(x + 4)x$

4. Tyler drew a diagram to expand  $(x + 5)(2x + 3)$ .

a. Explain Tyler's mistake.

		$2x$	$3$
$x$		$2x^2$	$3x$
	$5$	$7x$	$8$

b. What is the correct expanded form of  $(x + 5)(2x + 3)$ ?

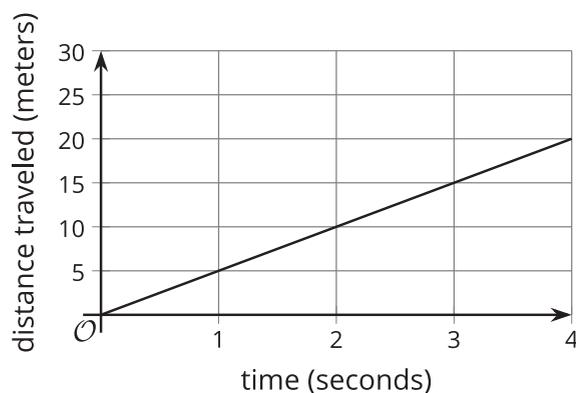
5. Explain why the values of the exponential expression  $3^x$  will eventually overtake the values of the quadratic expression  $10x^2$ .

(From Unit 6, Lesson 4.)

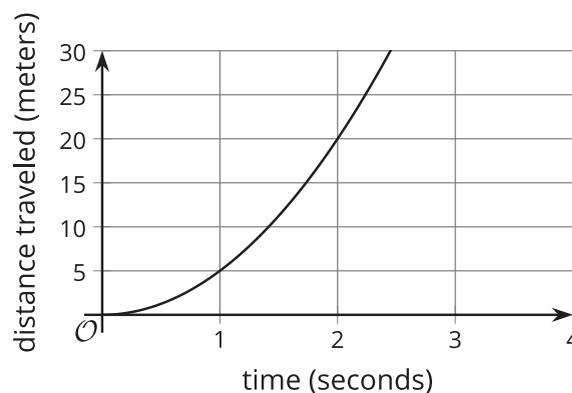
6. A baseball travels  $d$  meters  $t$  seconds after being dropped from the top of a building. The distance traveled by the baseball can be modeled by the equation  $d = 5t^2$ .

Which graph could represent this situation? Explain how you know.

**Graph A**



**Graph B**



(From Unit 6, Lesson 5.)

7. Consider a function  $q$  defined by  $q(x) = x^2$ . Explain why negative values are not included in the range of  $q$ .

(From Unit 4, Lesson 10.)

8. Based on past concerts, a band predicts selling  $600 - 10p$  concert tickets when each ticket is sold at  $p$  dollars.

a. Complete the table to find out how many concert tickets the band expects to sell and what revenues it expects to receive at the given ticket prices.

ticket price (dollars)	number of tickets	revenue (dollars)
10		
15		
20		
30		
35		
45		
50		
60		
$p$		

b. In this model, at what ticket prices will the band earn no revenue at all?

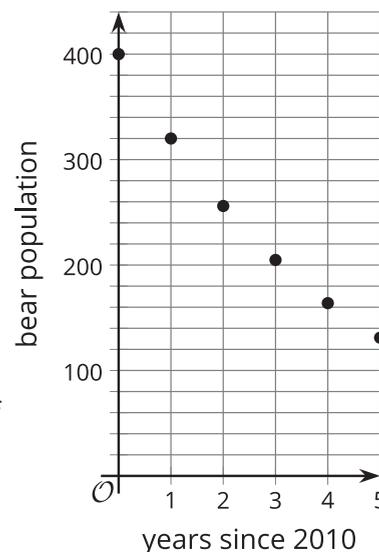
c. At what ticket prices should the band sell the tickets if it must earn at least 8,000 dollars in revenue to break even (to not lose money) on a given concert. Explain how you know.

(From Unit 6, Lesson 7.)

9. A population of bears decreases exponentially.

a. What is the annual factor of decrease for the bear population? Explain how you know.

b. Using function notation, represent the relationship between the bear population,  $b$ , and the number of years since the population was first measured,  $t$ . That is, find a function,  $f$ , so that  $b = f(t)$ .



(From Unit 5, Lesson 8.)

10. Equations defining functions  $a$ ,  $b$ ,  $c$ ,  $d$ , and  $f$  are shown here.

Select **all** the equations that represent exponential functions.

A.  $a(x) = 2^3 \cdot x$

B.  $b(t) = \left(\frac{2}{3}\right)^t$

C.  $c(m) = \frac{1}{5} \cdot 2^m$

D.  $d(x) = 3x^2$

E.  $f(t) = 3 \cdot 2^t$

(From Unit 5, Lesson 8.)