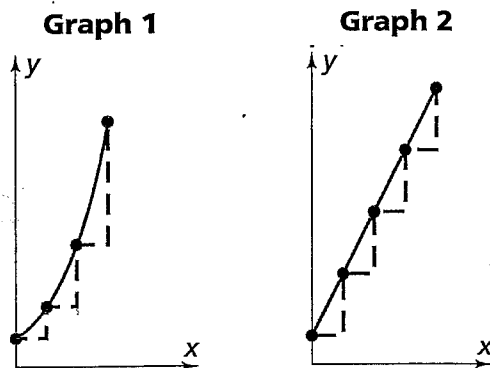For Exercises 5–7, write each number in scientific notation.

5. 100,000,000

6. 29,678,900,522

7. 11,950,500,000,000

For Exercises 8–10, write each number in standard form.

8. 6.43999001×10^8

9. 8.89234×10^5

10. $3.4348567000 \times 10^{10}$

16. The graphs below represent the equations $y = 2^x$ and $y = 2x + 1$.

Graph 1   Graph 2

a. Tell which equation each graph represents.
Explain your reasoning.

b. The dashed segments show the vertical and horizontal change between points at equal x intervals. For each graph, compare the vertical and horizontal change between pairs of points. What do you notice?

c. Does either equation represent an exponential function? A linear function? Explain.

14. Zak's uncle wants to donate money to Zak's school. He suggests three possible plans. Look for a pattern in each plan.

Plan 1 He will continue the pattern in this table until day 12.

School Donations

Day	1	2	3	4
Donation	$1	$2	$4	$8

Plan 2 He will continue the pattern in this table until day 10.

School Donations

Day	1	2	3	4
Donation	$1	$3	$9	$27

Plan 3 He will continue the pattern in this table until day 7.

School Donations

Day	1	2	3	4
Donation	$1	$4	$16	$64

a. Copy and extend each table to show how much money the school would receive each day.

b. For each plan, write an equation for the relationship between the day number n and the number of dollars donated d.

c. Are any of the relationships in Plans 1, 2, or 3 exponential functions? Explain.

d. Which plan would give the school the greatest total amount of money?

15. Carmelita is planning to swim in a charity swim-a-thon.
Several relatives said they would sponsor her.

> I will give you $1 if you swim 1 lap, $3 if you
> swim 2 laps, $5 if you swim 3 laps, $7 if you
> swim 4 laps, and so on.—**Grandmother**

> I will give you $1 if you swim 1 lap, $3 if you
> swim 2 laps, $9 if you swim 3 laps, $27 if you
> swim 4 laps, and so on.—**Father**

> I will give you $2 if you swim 1 lap, $3.50 if
> you swim 2 laps, $5 if you swim 3 laps, $6.50
> if you swim 4 laps, and so on.—**Aunt Josie**

> I will give you $1 if you swim 1 lap, $2 if you
> swim 2 laps, $4 if you swim 3 laps, $8 if you
> swim 4 laps, and so on.—**Uncle Sebastian**

> WOW! Thanks everyone for your support!—**Carmelita**

a. Decide whether each donation pattern is an *exponential function,
linear function,* or *neither*.

b. For each relative, write an equation for the total donation *d*
if Carmelita swims *n* laps. Which variable is the independent
variable? Dependent variable?

c. For each plan, tell how much money Carmelita will raise if she
swims 20 laps.

9. **JUSTIFY** Lily has a storage box shaped like a rectangular prism with a length of 4 feet, a width of 3 feet, and a height of 2 feet. She has a fishing pole that is 6 feet long. Can she store the fishing pole in the box? Use words, numbers, and/or diagrams to justify your answer.

_____

_____

11. **COMPARE** Compare $\overline{PQ}$ to $\overline{PR}$. Which line segment is longer? How many units longer? Show your work.

_____
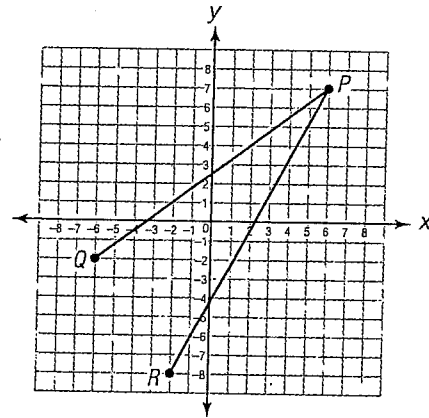
For Exercises 45–47, find the slope and y-intercept of the graph of each equation.

45. $y = 3x - 10$

46. $y = 1.5 - 5.6x$

47. $y = 15 + \dfrac{2}{5}x$

49. Consider the two equations below.

Equation 1	**Equation 2**
$r = 3^n - 1$	$r = 3^{n-1}$

a. For each equation, find r when n is 2.

b. For each equation, find r when n is 10.

c. Explain why the equations give different values of r for the same value of n.

d. Do either of these equations represent an exponential function? Explain why.