

19. Suppose a movie ticket costs about \$7, and inflation causes ticket prices to increase by 4.5% a year for the next several years.

- a. How much will a ticket cost 5 years from now?
- b. How much will a ticket cost 10 years from now? 30 years from now?
- c. How many years will it take for the cost of a ticket to exceed \$26?



For Exercises 27–30, tell whether the pattern represents exponential growth. Explain your reasoning. If the pattern is exponential, give the growth factor.

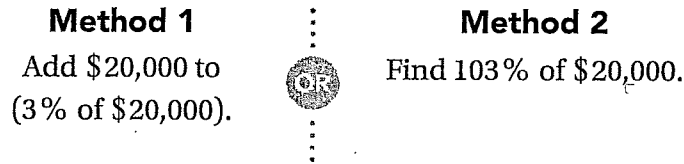
27. 1 1.1 1.21 1.331 1.4641 1.61051 1.771561

28. 3 5 $8\frac{1}{3}$ $13\frac{8}{9}$ $23\frac{4}{27}$

29. 3 $4\frac{2}{3}$ $6\frac{1}{3}$ 8 $9\frac{2}{3}$ $11\frac{1}{3}$

30. 2 6.4 20.5 66 210

31. A worker currently receives a yearly salary of \$20,000.
- Find the dollar values of a 3%, 4%, and 5% raise for this worker.
 - Find the worker's new annual salary for each raise in part (a).
 - Joanne says that she can find the new salary with a 3% raise in two ways:



Explain why these two methods give the same result.

34. Kwan cuts lawns every summer to make money. One customer offers to give her a 3% raise next summer and a 4% raise the summer after that. Kwan says she would prefer to get a 4% raise next summer and a 3% raise the summer after that. She claims she will earn more money this way. Is she correct? Explain.

39. a. Match each growth rate from List 1 with the equivalent growth factor in List 2 if possible.

List 1

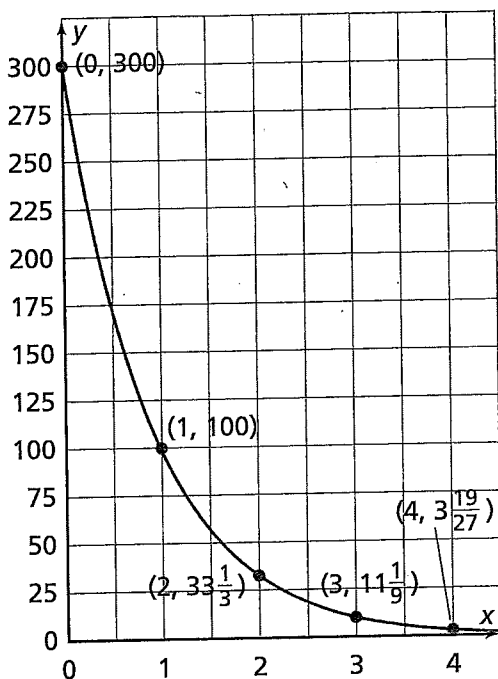
20%, 120%, 50%, 200%, 400%, 2%

List 2

1.5, 5, 1.2, 2.2, 4, 2, 1.02

- Order the growth rates from List 1 from least to greatest.
- Order the growth factors from List 2 from least to greatest.

7. The graph below shows an exponential decay relationship.



- Find the decay factor and the y -intercept.
- What is the equation for the graph?

For Exercises 19–22, write each number in scientific notation.

- There are about 33,400,000,000,000,000 molecules in 1 gram of water.
- There are about 25,000,000,000,000 red blood cells in the human body.
- Earth is about 93,000,000 miles (150,000,000 km) from the sun.
- The Milky Way galaxy is approximately 100,000 light years in diameter. It contains about 300,000,000,000 stars.

15. Hot coffee is poured into a cup and allowed to cool. The difference between coffee temperature and room temperature is recorded every minute for 10 minutes.

Cooling Coffee

Time (min)	0	1	2	3	4	5	6	7	8	9	10
Temperature Difference ($^{\circ}\text{C}$)	80	72	65	58	52	47	43	38	34	31	28

- Plot the data (*time, temperature difference*). Explain what the patterns in the table and the graph tell you about the rate at which the coffee cools.
- Approximate the decay factor for this relationship.
- Write an equation for the relationship between time and temperature difference.
- About how long will it take the coffee to cool to room temperature? Explain.

