1. Investors in the Get-Rich-Quick Investment company lose about 15% of the value of their money each year.

a. Fill in the table to show the value of a $2,000 investment for each of the first seven years.

| YEAR | VALUE |
|---|---|
| 0 | $2,000 |
| 1 | $1,700 |
| 2 | $1,445 |
| 3 | $1,228.25 |
| 4 | $1,044.01 |
| 5 | $887.41 |
| 6 | $754.30 |

b. How much was lost the first year?

$300

c. How much was lost from the fifth to the sixth year?

$133.11

d. Write an expression for the value of the investment in year $x$.

$2000(0.85)^x$

e. Use trial and error to find the first year in which the value is less than $100.

year 19

3. In 1993, the national debt was estimated at 4.4 trillion dollars. Suppose this were cut 10% each year. Let $x$ be the number of years since 1993.

4,400,000,000,000$(.9)^x$

a. Write an equation to describe this situation.

$d = 4.4 \cdot 10^{12}(0.9)^x$

b. What would the deficit be after 20 years?

$\approx 5.35 \cdot 10^{11}$ dollars

about $535,000,000,000

**In 4–7, *multiple choice*. Tell if the situation described is:**

**(a) exponential growth.** **(b) exponential decay.**

**(c) constant increase.** **(d) constant decrease.**

4. Every year there are 5% fewer patients with the disease. b

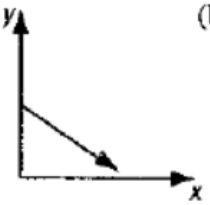
5. With better techniques, farmers are able to increase their output 3% each year. a

6. Each year there are 30 fewer students in the school. d

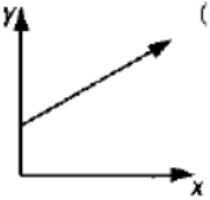
7. Every time Joan took the test her score went up 4 points. c

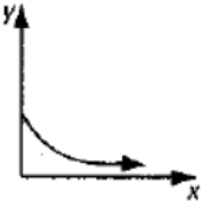
**Representations** Objective I

**In 8–11, *multiple choice*. Match the graph to the equation.**

(a) 


(b) 


(c) 


(d) 


8. $y = 2x + 5$ c

9. $y = -2x + 5$ a

10. $y = 5 \cdot 1.02^x$ b

11. $y = 5 \cdot .98^x$ d