3. a. $\frac{1}{4}$
   b. 8

4. a. $\frac{1}{16}$
   b. 64

5. a. $\frac{8}{9}$
   b. 216

6. a. $\frac{3}{2}$
   b. 48

7. a. $\frac{46}{9}$
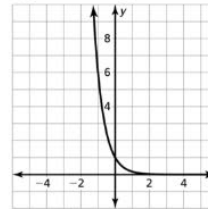   **b.** 32

8. a. $-\frac{7}{4}$
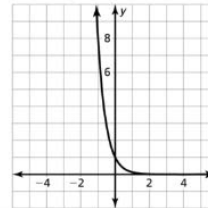   **b.** 6

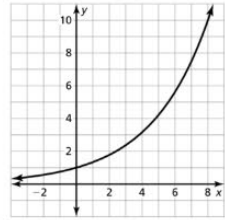**9.** exponential growth

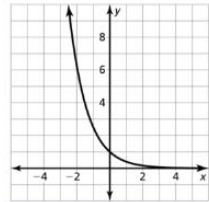**10.** exponential growth

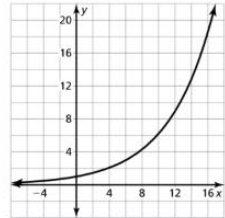**11.** exponential decay

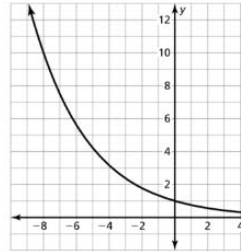
12. exponential decay

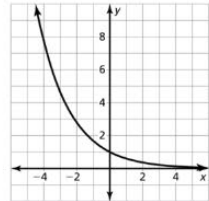**13.** exponential growth

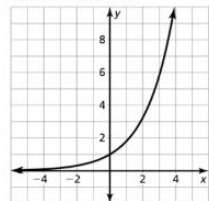**14.** exponential decay

15. exponential growth

16. exponential decay

17. exponential decay

18. exponential growth

19. $b = 3$

20. $b = 5$

21. a. exponential decay
   b. 25% decrease
   c. in about 4.8 years

22. a. exponential growth
   b. 3% increase
   c. about 6 years after the start of the decade