Chapter 9 Quiz Review

1. Pete purchased a house for $220,000 in 1996. The value of his home increased steadily at a rate of 3.2% annually. If Pete sells his house in 2011, how much money can he expect to sell the house for? Round to the nearest whole dollar.
2. A research association reported that 3,173,000 gas grills were shipped by various manufacturers in the US in 1985. Shipments increased by about 7% per year from 1985 to 2002. Write a function that models the number of gas grills shipped over time. About how many gas grills were shipped in 2002?
3. A pond has 98 fish and the population decreases by 5% each day. Find the population after 3 weeks.
4. A computer is worth $4000 when it is new. After each year it is worth half of what it was the previous year. What will its worth be after 5 years?
5. The function $(x) = 5000(0.972)^x$, where x is the time in years, models a declining lemming population. How m any lemmings will there be in 6 years?
6. $5,000 is invested into an account with a rate of 4% compounded quarterly. What will the value of the account be after 3 years?

Re-write the equation without the *h* component.

7. $f(x) = 2(3)^{x-2} + 2$
8. $f(x) = \frac{1}{2}(4)^{x+1}$

Determine if the function is geometric, linear, quadratic, or neither. If the function is geometric, write an explicit rule for the function. Then find the 10th term.

9. $3, 12, 48, 192 \ldots$
10. $1024, 128, 16, 2 \ldots$
11. $34, 28, 22, 16 \ldots$
12. $29, 43, 57, 71 \ldots$
13. $9, -18, 36, -72 \ldots$
14. $7, 16, 25, 34 \ldots$

15. The first term of a geometric sequence is 15 and the common ratio is $\frac{2}{3}$. What is the 9th term of the sequence?

Write an explicit rule for the sequence represented by the given terms.

16. $a_5 = 3$ and $a_7 = 147$
17. $a_3 = 10$ and $a_5 = 1440$

Write an equation to determine the amount of substance left given the half-life of the substance. Then find the amount left after the given length of time.

18. 10,000 grams of Antimony-126m; half-life 19 days; 171 days
19. 10,000 grams of Astintine-218; half-life 2 seconds; 16 seconds
20. 500 grams of Cerium-143; half-life 33 hours; 11 days

Graph the functions. Identify the domain, range, horizontal asymptote. Compare the function to the parent function $f(x) = b^x$

21. $f(x) = 2\left(\frac{1}{2}\right)^x$
22. $f(x) = -3(4)^x + 2$

Ch. 9 (Quiz Review)

1. $A = 220{,}000(1.032)^t$
$220{,}000(1.032)^{15}$
$\$352,873$

2. $A = 3{,}173{,}000(1.07)^t$
$3{,}173{,}000(1.07)^{17}$
≈ 10029921 grills.

3. $A = 98(1-.05)^t$
$98(.95)^{21}$
33 fish.

4. $A = 4000(.5)^t$
$4000(.5)^5$
$\$125$

5. $f(x) = 5000(.972)^x$
$5000(.972)^6$
4217 lemmings.

6. $A = 5000\left(1+\frac{.04}{4}\right)^{4t}$
$5000(1.01)^{12}$
$\$5634.13$

7. $f(x) = 2(3)^{x-2} + 2$ ← h component
$2(3^x)(3^{-2}) + 2$
$2(3^{-2})(3^x) + 2$
$2 \cdot \frac{1}{9}(3^x) + 2$
$f(x) = \frac{2}{9}(3^x) + 2$

8. $f(x) = \frac{1}{2}(4)^{x+1}$

$\frac{1}{2}(4^x)(4)$

$f(x) = 2(4^x)$

9. 3, 12, 48, 192

×4

geometric

$a_n = 3(4)^{n-1}$

$a_{10} = 3(4)^{10-1}$

$a_{10} = 786432$

* 10. 1024, 128, 16, 2

$\frac{1}{8}$

geometric

$a_n = 1024(\frac{1}{8})^{n-1}$

$a_{10} = 1024(\frac{1}{8})^9$

$\frac{1024}{1374217728}$

$\frac{1}{131072}$

11. 34, 28, 22, 16

linear -6

12. 29, 43, 57, 71

14 14 14

linear

13. 9, -18, 36, -72

-2 geometric

$a_n = 9(-2)^{n-1}$

$a_{10} = 9(-2)^9$

$a_{10} = -4608$

14. 7, 11, 15, 19, 23
+4 +4 +4
linear

15. $a_n = 15\left(\frac{2}{3}\right)^{n-1}$
$a_9 = 15\left(\frac{2}{3}\right)^{8}$

$15\left(\frac{256}{6561}\right)$

$\frac{3840}{6561} = \frac{1280}{2187}$

16. $a_5 = 3 \quad a_7 = 147$

$a_7 = a_6 r$
$a_7 = a_5 \cdot r \cdot r$
$a_7 = a_5 \cdot r^2$
$147 = 3r^2$
$49 = r^2$
$7 = r$
$a_n = a_1 r^{n-1}$
$3 = a_1 7^{5-1}$
$3 = a_1 7^4$
$3 = a_1 2401$
$\frac{3}{2401} = a$
$a_n = \frac{3}{2401}(7)^{n-1}$

17. $a_3 = 10 \quad a_5 = 1440$

$1440 = 10r^2$
$144 = r^2$
$12 = r$
$10 = a(12)^2$
$10 = 144a$
$\frac{5}{72} = a$
$a_n = \frac{5}{72}(12)^{n-1}$

18. $A = 10{,}000(.5)^{\frac{171}{19}}$

19,531.25 grams

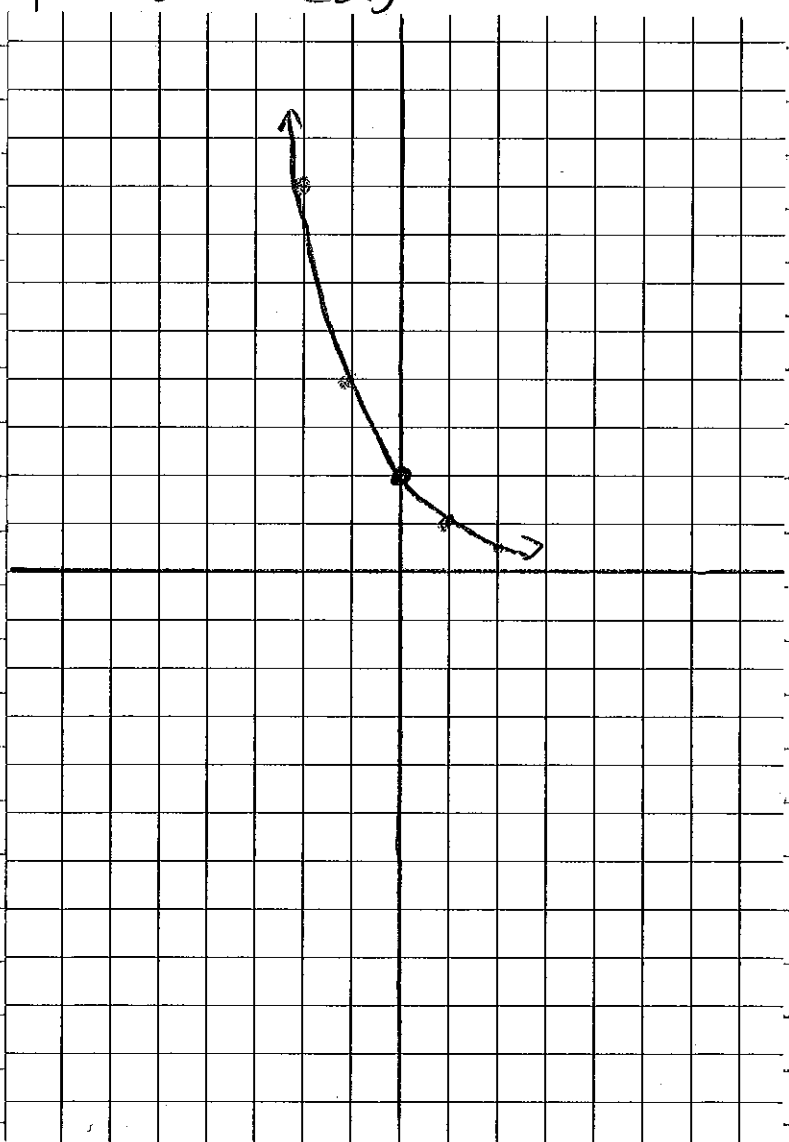
19. $A = 10{,}000(.5)^{\frac{16}{2}}$

39,062.5 grams.

20. $A = 500(.5)^{\frac{2641}{33}}$

1.953125 grams

21. $f(x) = 2\left(\frac{1}{2}\right)^x$



x	f(x)
-2	$2 \cdot 2^2 = 8$
-1	4
0	2
1	1
2	$\frac{1}{2}$

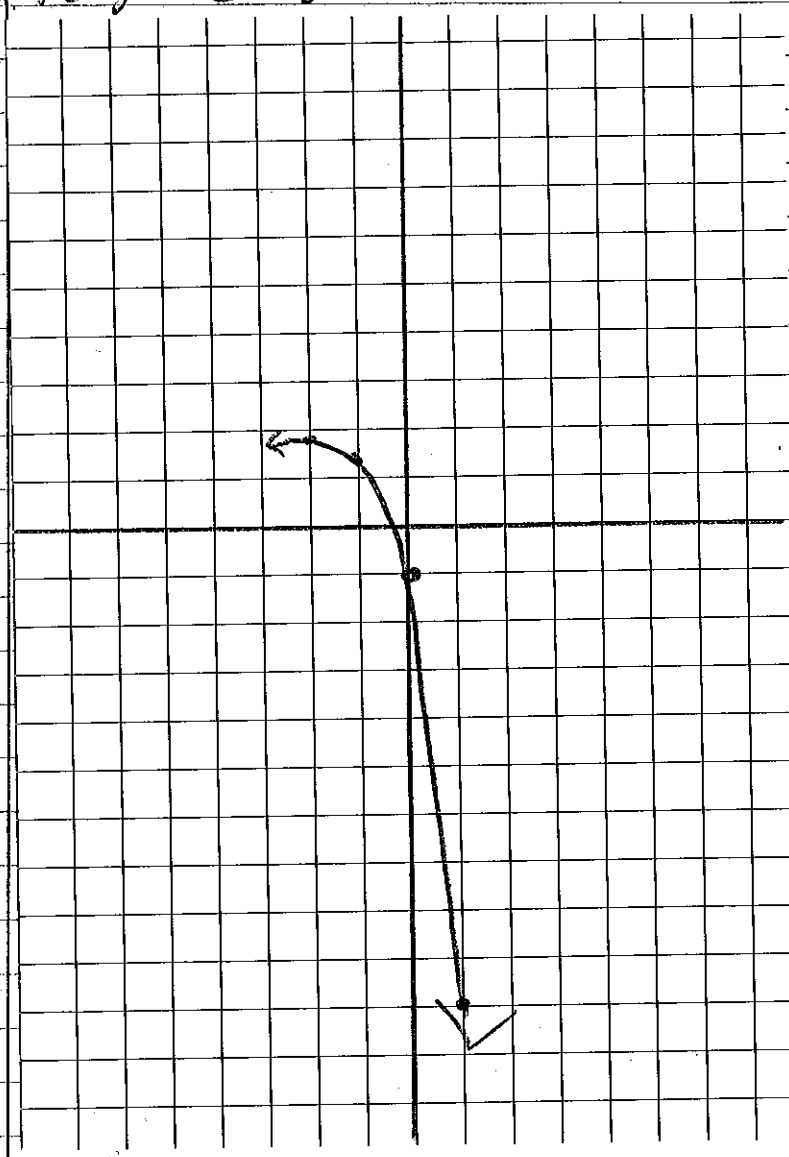
D: {all real numbers}

R: {y | y > 0}

asymptote y = 0

vertical stretch by factor of 2.

22. $f(x) = -3(4)^x + 2$



x	y
-2	$1\frac{5}{8}$
-1	$1\frac{1}{4}$
0	-1
1	-10
2	-46

D: {all real numbers}
R: $\{y \mid y < 2\}$
asymptote $y = 2$

vertical stretch with reflection by factor of -3
vertical translation up 2 units.