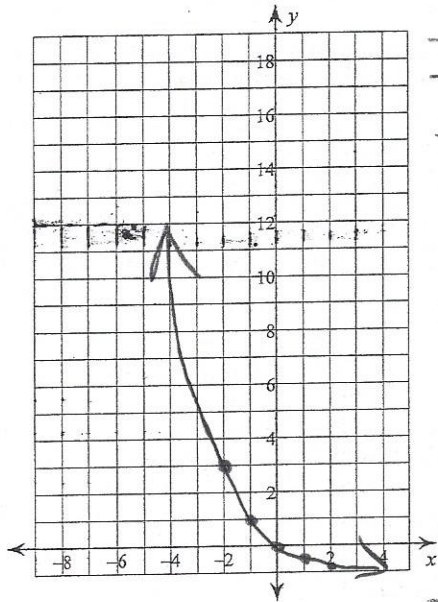


Exponential Function Review

Graph each function. State the domain, range, and equation of the asymptote.

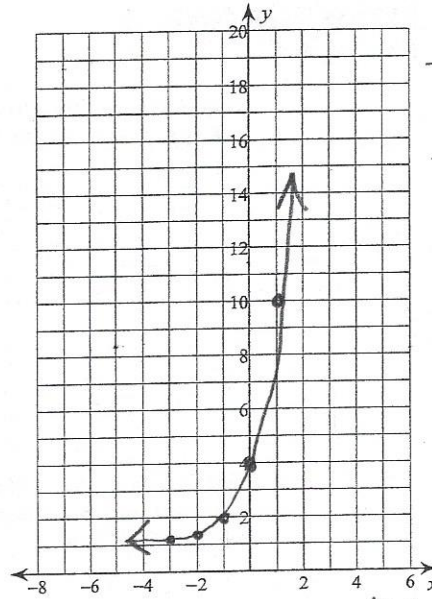
1) $y = \left(\frac{1}{2}\right)^{x+2} - 1$



X	Y
-2	4 = 3
-1	2 = 1
0	1 = 0
1	1/2 = -1/2
2	1/4 = -3/4

HA: $y = -1$
 D: $(-\infty, \infty)$
 R: $(-1, \infty)$

2) $y = 3^{x+1} + 1$



X	Y
-3	1/9 = 1/9
-2	1/3 = 1/3
-1	1 = 2
0	3 = 4
1	9 = 10

HA: $y = 1$
 D: $(-\infty, \infty)$
 R: $(1, \infty)$

Solve each equation.

3) $3^{3x-3} = 9$ $3^{3x-3} = 3^2$
 $3x-3=2$
 $3x=5$ $x = \frac{5}{3}$

4) $4^{-n-1} = 1$ $4^{-n-1} = 4^0$
 $-n-1=0$
 $n = -1$

5) $6^{-3v} = 6^{-3v}$
 $-3v = -3v$
 All Real Numbers

6) $\frac{2^{-x-2}}{2^{-3x}} = 16$ $2^{(-x-2)-(-3x)} = 2^4$
 $2x-2=4$
 $2x=6$ $x = 3$

7) $4^{3r} = 16$ $4^{3r} = 4^2$
 $3r=2$
 $r = \frac{2}{3}$

8) $32^{2p} = 16^{3-p}$ $2^{5(2p)} = 2^{4(3-p)}$
 $10p = 12 - 4p$ $p = \frac{12}{14}$ $p = \frac{6}{7}$
 $14p = 12$

9) $6^{2n} \cdot 6^n = 6^{-n}$ $6^{2n+n} = 6^{-n}$
 $3n = -n$
 $4n = 0$ $n = 0$

10) $9 \cdot 3^{x+3} = 1$ $3^2 \cdot 3^{x+3} = 3^0$ $3^{2+(x+3)} = 3^0$
 $x+5=0$
 $x = -5$

BENCHMARK 5*(Chapters 9 and 10)*

Use differences or ratios to tell whether the table of values represents a *linear function*, an *exponential function*, or a *quadratic function*.

4.

x	-1	0	1	2	3
y	-3	2	7	12	17

Linear

5.

x	-1	0	1	2	3
y	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9

Exponential

6.

x	-1	0	1	2	3
y	6	3	4	9	18

Quadratic

Tell whether the table of values represents a *linear function*, an *exponential function* or a *quadratic function*. Then write an equation for the function.

7.

x	-1	0	1	2	3
y	-3	-1	1	3	5

Linear

8.

x	-2	-1	0	1	2
y	16	4	0	4	16

Quadratic

9.

x	-1	0	1	2	3
y	0.1	0	0.1	0.4	0.9

Quadratic

10.

x	-2	-1	0	1	2
y	-6	-2	2	6	10

Linear

1. You start an account with \$500 and an interest rate of 6% compounded yearly. How much is in the account after 3 years?

a) Exponential growth or decay: *Growth*

b) Identify the initial amount: *\$500*

c) Identify the growth/decay factor: *$1 + .06 = 1.06$*

d) Write an exponential function to model the situation: *$y = 500(1 + .06)^t$*

e) "Do" the problem: *$y = 500(1.06)^3$*

$$y = 595.51$$

\$595.51

2. From 2000 - 2010 a city had a 2.5% annual decrease in population. If the city had 2,950,000 people in 2000, determine the city's population in 2008.

a) Exponential growth or decay: *decay*

b) Identify the initial amount: *2,950,000*

c) Identify the growth/decay factor: *$1 - .025 = .975$*

d) Write an exponential function to model the situation: *$y = 2950000(1 - .025)^t$*

e) "Do" the problem: *2,409,123 people*

Remember: a) Exponential growth or decay:

- b) Identify the initial amount:
- c) Identify the growth/decay factor:
- d) Write an exponential function to model the situation:
- e) "Do" the problem:

3. You buy a car for \$8000 that depreciates at a rate of 11% a year. How much is the care worth after 5 years?

$$\begin{aligned}y &= 8000(1-.11)^5 \\ &= 8000(.89)^5 \\ &= \boxed{\$4467.25}\end{aligned}$$

4. You start an account with \$2500 and an interest rate of 6.5% compounded yearly. How much is in the account after 7 years?

$$\begin{aligned}y &= 2500(1+.065)^7 \\ &= 2500(1.065)^7 \\ &= \boxed{\$3884.97}\end{aligned}$$

5. A newly hatched channel catfish typically weighs about 0.06 gram. During the first 6 weeks of life, its weight increases by about 10% each day. Write a function to model the situation. How much does the catfish weigh after 6 weeks?

$$\begin{aligned}y &= .06(1+.10)^6 \\ &= .06(1.1)^6 \\ &= \boxed{.11 \text{ gram}}\end{aligned}$$