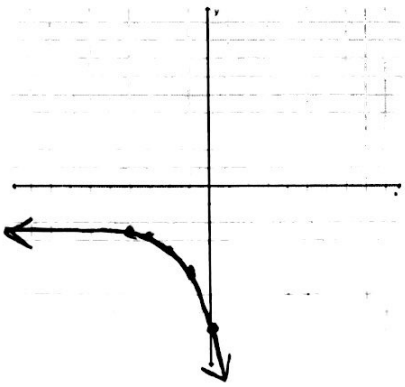
Chapter 7 Review Worksheet (7.1-7.4)

Name: KEY

Graph the function. Then state the domain and range.

1.) $f(x) = -3 \cdot 2^{x+1} - 2$

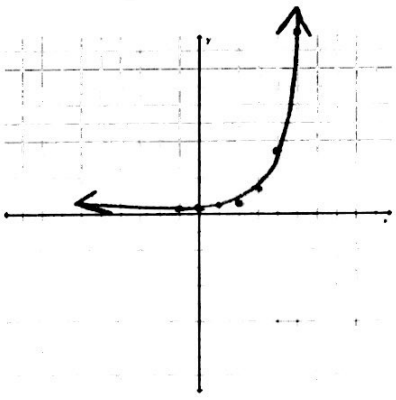


X	Y
-4	-2.375
-3	-2.75
-2	-3.5
-1	-5
0	-8
1	-14

domain: $(-\infty, \infty)$ OR $\mathbb{R}$

range: $(-\infty, -2)$

2.) $y = \frac{1}{2}e^{x-2}$

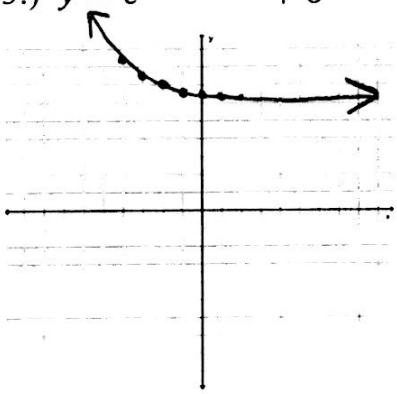


X	Y
-1	0.02
0	0.07
1	0.18
2	0.5
3	1.36
4	3.69
5	10.04

domain: $(-\infty, \infty)$ OR $\mathbb{R}$

range: $(0, \infty)$

3.) $y = e^{-0.4(x+2)} + 6$

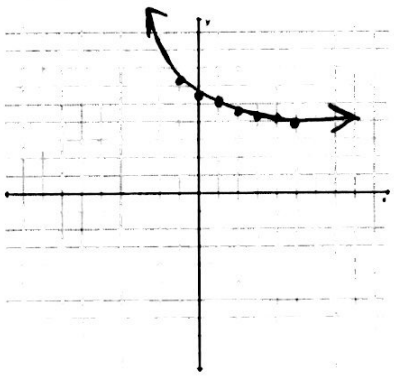


X	Y
-4	8.23
-3	7.49
-2	7
-1	6.67
0	6.45
1	6.3
2	6.2

domain: $(-\infty, \infty)$ OR $\mathbb{R}$

range: $(6, \infty)$

4.) $y = 2(0.8)^{x-1} + 3$



X	Y
-1	6.13
0	5.5
1	5
2	4.6
3	4.28
4	4.02
5	3.82

domain: $(-\infty, \infty)$ OR $\mathbb{R}$

range: $(3, \infty)$

5.) You deposit \$1,500 into an account that pays 7% annual interest compounded daily. Find the balance of the account after 2 years.

$A = P\left(1 + \frac{r}{n}\right)^{nt}$

$A = 1500\left(1 + \frac{0.07}{365}\right)^{365 \cdot 2}$

$A \approx \$1725.39$

6.) You deposit $750 in a bank account. Find the balance after 5 years for each of the situations described below.

$A = P\left(1 + \frac{r}{n}\right)^{nt}$

a.) The account pays 2.5% annual interest compounded annually.

$A = 750\left(1 + \frac{0.025}{1}\right)^{(1 \cdot 5)}$

$A \approx \boxed{\$848.56}$

b.) The account pays 2.75% annual interest compounded monthly.

$A = 750\left(1 + \frac{0.0275}{12}\right)^{(12 \cdot 5)}$

$A \approx \boxed{\$860.42}$

$A = Pe^{rt}$

c.) The account pays 3% annual interest compounded continuously.

$A = 750 \cdot e^{0.03 \cdot 5}$

$A \approx \boxed{\$871.38}$

7.) From 1996 to 2001, the number of households that purchased lawn and garden products at home gardening centers increased by about 4.85% per year. In 1996, about 62 million households purchased lawn and garden products.

a.) Write a function giving the number of households H (in millions) that purchased lawn and garden products t years after 1996. (Remember to simplify)

$H = 62(1 + 0.0485)^t$

$\boxed{H = 62(1.0485)^t}$

b.) Approximately how many households purchased lawn and garden products were purchased in 2000?

$H = 62(1.0485)^4$

$H \approx \boxed{74.9 \text{ million}}$

8.) Your new boat is depreciating at an annual rate of 4%. You purchased the boat for $1,906.

a.) Write a function that models the value y of the boat over time t.

$y = 1906(1 - 0.04)^t$

$\boxed{y = 1906(0.96)^t}$

c.) What was the approximate value of the boat in 5 years?

$y = 1906(0.96)^5$

$y \approx \boxed{\$1,554.10}$

Rewrite the equation in its alternate form.

9.) $\log_2 128 = 7$

$2^7 = 128$

10.) $y = 5^{x+3}$

$\log_5 y = x + 3$

11.) $\ln 5x = 2.5$

$e^{2.5} = 5x$

12.) $10^{3x} = 50$

$\log 50 = 3x$

Evaluate the logarithm without using a calculator.

13.) $\log_3 243$

$3^? = 243$

5

14.) $\log_7 1$

$7^? = 1$

0

15.) $\log_{1/6} 216$

$\frac{1}{6}^? = 216$

-3

16.) $\log_{125} \frac{1}{5}$

$125^? = \frac{1}{5}$

$-\frac{1}{3}$

Find the inverse of the function.

17.) $y = \log_5 x$

$5^y = x$

$5^x = y$

$y = 5^x$

18.) $y = e^{x+2}$

$\ln y = x + 2$

$\ln x = y + 2$

$y = \ln x - 2$

19.) $f(x) = \log_6(x + 2)$

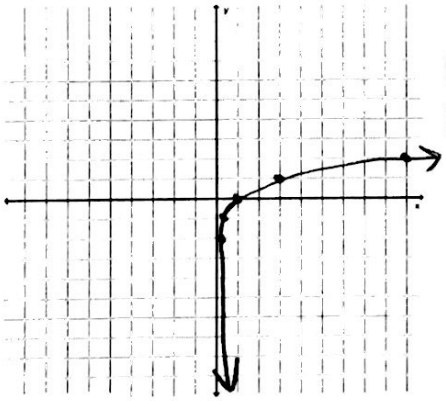
$6^y = x + 2$

$6^x = y + 2$

$y = 6^x - 2$

Graph the function. Then state the domain and range.

20.) $y = \log_3 x$ ⟶ $3^y = x$

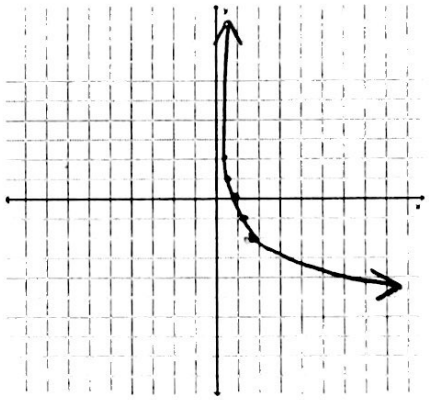


x	y
0.11	-2
0.33	-1
1	0
3	1
9	2

domain: $(0, \infty)$

range: $(-\infty, \infty)$ or $\mathbb{R}$

21.) $f(x) = \log_{4/5} x$ ⟶ $(\frac{4}{5})^y = x$

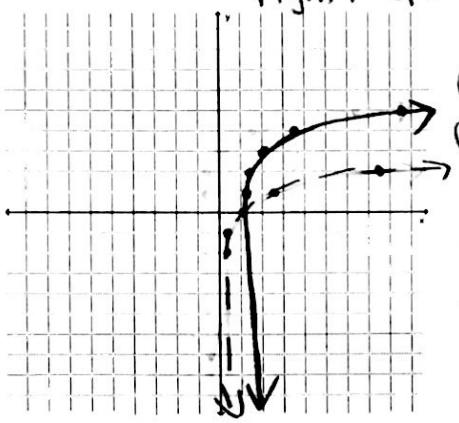


x	y
1.56	-2
1.25	-1
1	0
0.8	1
0.64	2

domain: $(0, \infty)$

range: $(-\infty, \infty)$ or $\mathbb{R}$

22.) $g(x) = \ln(x-1)+3$ right 1 up 3 $e^y = x$

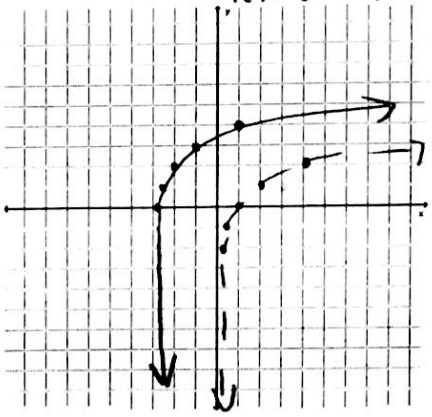


x	y
0.14	-2
0.37	-1
1	0
2.72	1
7.39	2

domain: $(1, \infty)$

range: $(-\infty, \infty)$ OR $\mathbb{R}$

23.) $y = \log_2(x+3)+2$ left 3 up 2 $2^y = x$



x	y
0.25	-2
0.5	-1
1	0
2	1
4	2

domain: $(-2, \infty)$

range: $(-\infty, \infty)$ OR $\mathbb{R}$

24.) Researchers have found that after 25 years of age, the average size of the pupil in a person's eye decreases. The relationship between pupil diameter d (in millimeters) and a (in years) can be modeled by $d = -2.1158 \ln a + 13.669$. What is the average diameter of a pupil for a person that is 25 years old? 50 years old?

25 years old:

$d = -2.1158 \ln 25 + 13.669$

$d \approx \boxed{6.86 \text{ mm}}$

50 years old:

$d = -2.1158 \ln 50 + 13.669$

$d \approx \boxed{5.39 \text{ mm}}$