

Graphing Exponential Function

Sketch the graph of each function. $3(2^x)$

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

x	y
0	3
1	6

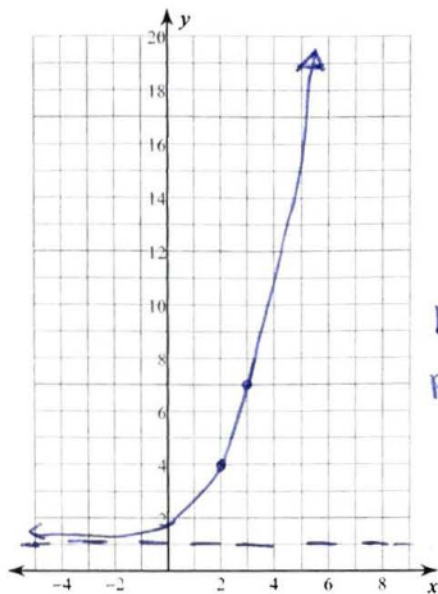
$h=2$ $k=1$

x	y
2	4
3	7

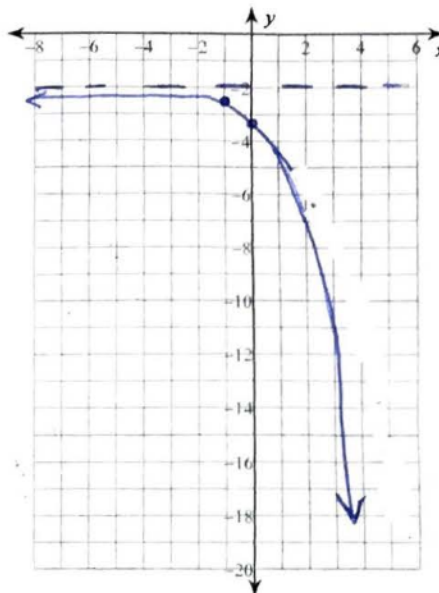
Asym: $y = 1$

D: $\{x \in \mathbb{R}\}$

R: $\{y \in \mathbb{R} \mid y > 1\}$



2) $f(x) = -\frac{1}{2}e^{x+1} - 2$



Period 2

$-\frac{1}{2}e^x$	y
0	$-\frac{1}{2}$
1	-1.355

$h=-1$ $k=-2$

x	y
-1	-2.5
0	-3.355

Asym: $y = -2$

D: $\{x \in \mathbb{R}\}$

R: $\{y \in \mathbb{R} \mid y < -2\}$

3) $f(x) = -4 \cdot 2^{x-1} + 2$

$-4(2^x)$

x	y
0	-4
1	-8

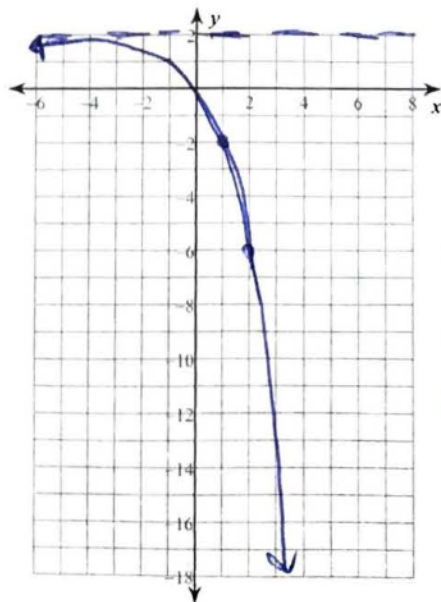
$h=1$ $k=2$

x	y
1	-2
2	-6

Asym: $y = 2$

D: $\{x \in \mathbb{R}\}$

R: $\{y \in \mathbb{R} \mid y < 2\}$



4) $f(x) = 3e^{x+2} + 2$

$3e^x$	y
0	3
1	8.13

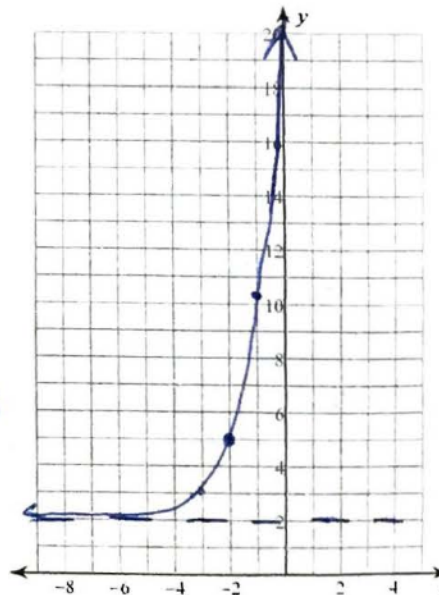
$h=-2$ $k=2$

x	y
-2	5
-1	10.13

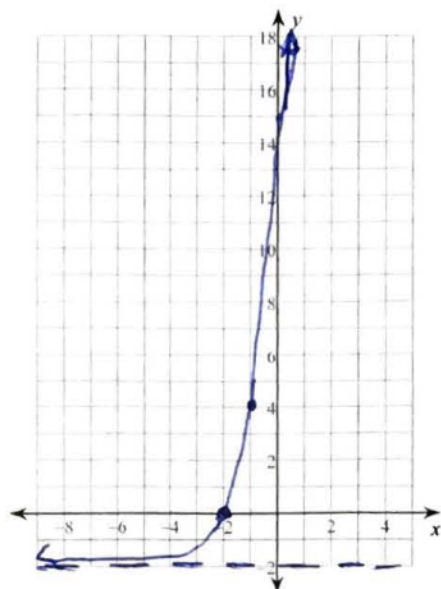
Asym: $y = 2$

D: $\{x \in \mathbb{R}\}$

R: $\{y \in \mathbb{R} \mid y > 2\}$



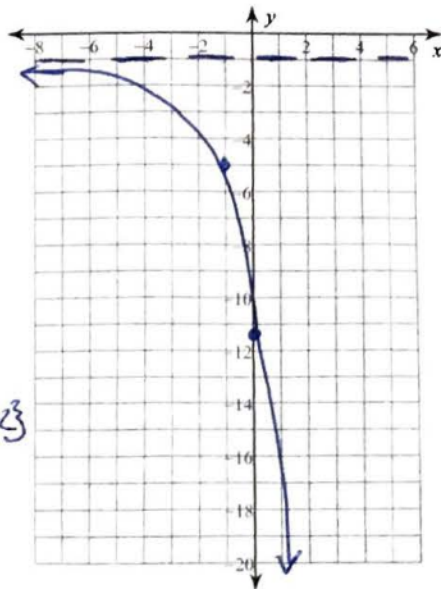
5) $f(x) = 2 \cdot 3^{x+2} - 2$



$$\begin{array}{c} 2 \cdot 3^x \\ \hline x \quad y \\ 0 \quad 2 \\ 1 \quad 6 \\ \hline n = -2 \quad k = -2 \\ \hline x \quad y \\ -2 \quad 0 \\ -1 \quad 4 \end{array}$$

Asym: $y = -2$
 D: $\{x \in \mathbb{R}\}$
 R: $\{y \in \mathbb{R} \mid y > -2\}$

6) $f(x) = -4e^{x+1} - 1$



$$\begin{array}{c} -4e^x \\ \hline x \quad y \\ 0 \quad -4 \\ 1 \quad -10.84 \end{array}$$

$$\begin{array}{c} n = -1 \quad k = -1 \\ \hline x \quad y \\ -1 \quad -5 \\ 0 \quad -11.84 \end{array}$$

Asym: $y = -1$
 D: $\{x \in \mathbb{R}\}$
 R: $\{y \in \mathbb{R} \mid y < -1\}$

- 7) ^P Huong invests \$8,193 in a savings account with a fixed annual interest rate of 5% compounded continuously. What will the account balance be after 9 years?

$$A = Pe^{rt} \quad r = 0.05(9)$$

$$A = 8193 e$$

$$A \approx \$12,849.18$$

- 8) ^P Ryan invests \$7,060 in a retirement account with a fixed annual interest rate of 8% compounded 2 times per year. What will the account balance be after 15 years?

$$A = 7060 \left(1 + \frac{0.08}{2}\right)^{2(15)} e$$

$$A \approx \$22,898.39$$

- 9) Scott invests a sum of money in a retirement account with a fixed annual interest rate of 8% compounded continuously. After 16 years, the balance reaches \$4,492.20. What was the amount of the initial investment?

$$A = Pe^{rt}$$

$$\frac{A}{e^{rt}} = P$$

$$\frac{4492.20}{e^{0.08(16)}} = P$$

$$P \approx \$1,249.00$$

- 11) Use Properties of exponents to determine which function (if any) are the same.

$$f(x) = 5^{-x} + 3 \quad f(x) = 5^{-x} + 3$$

$$g(x) = 5^{3-x} \quad f(x) \neq g(x)$$

$$h(x) = -5^{x-3}$$

$$g(x) = 5^{3-x}$$

$$= 5^{-1(3-x)}$$

$$= 5^{-3+x}$$

$$= 5^{x-3} \rightarrow g(x) \neq h(x)$$

- 10) Use Properties of exponents to determine which function (if any) are the same.

$$f(x) = 4^x + 12 \quad f(x) = 4^x + 12$$

$$g(x) = 2^{2x} + 6 \quad = (2^2)^x + 12$$

$$h(x) = 64 \cdot 4^x \quad = 2^{2x} + 12$$

$$f(x) \neq g(x)$$

$$g(x) = 2^{2x} + 6 \quad f(x) = 4^x + 12$$

$$= 2^{2x} \cdot 2^6 \quad = 4^x + 4 \cdot 3$$

$$= 4^x \cdot 64 \quad = 4^x + 12$$

$$g(x) = h(x) \quad f(x) \neq h(x)$$

