

Practice Exponential and Logistic Functions

Identify all of the requested information for each function below, then match the function with its graph:

1. $f(x) = (3/4)^{-x} + 2$

B $a = 1$
 $b = 4/3$

growth or decay
(circle one)

Eq. of H.A.: $y = 2$

y-intercept: $(0, 3)$

2. $f(x) = (3/4)^{-x-1} + 2$

A $a = 1$
 $b = 4/3$ $(3/4)^{-(x+1)} + 2$

growth or decay
(circle one)

Eq. of H.A.: $y = 2$

y-intercept: $(0, 10/3)$

3. $f(x) = (3/4)^{-x-2} - 1$

C $a = 1$
 $b = 4/3$ $(3/4)^{x+2} - 1$

growth or decay
(circle one)

Eq. of H.A.: $y = -1$

y-intercept: $(0, 7/9)$

4. $f(x) = (1/3)^{-x+1}$

E $a = 1$
 $b = 3$ $(3)^{x-1}$

growth or decay
(circle one)

Eq. of H.A.: $y = 0$

y-intercept: $(0, 1/3)$

5. $f(x) = -(1/3)^{-x+1} - (3)^{x-1}$

F $a = -1$ ← a is neg,
 $b =$

neither or decay
(circle one)

Eq. of H.A.: $y = 0$

y-intercept: $(0, -1/3)$

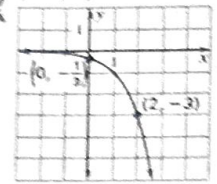
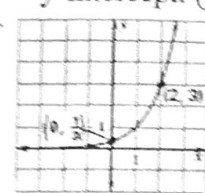
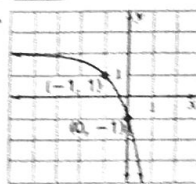
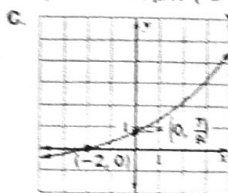
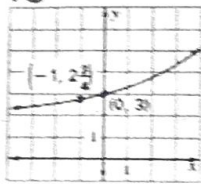
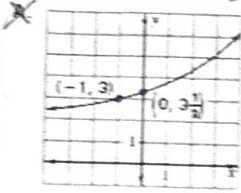
6. $f(x) = -(1/3)^{-x-1} + 2$

D $a = -1$ ← a is neg,
 $b = 3$ $-(3)^{x+1} + 2$

neither or decay
(circle one)

Eq. of H.A.: $y = 2$

y-intercept: $(0, -1)$



7. Explain the transformations applied to the graph of $f(x)$ which would result in the graph of $g(x)$

a. $f(x) = (4/3)^x$

$g(x) = (0.75)^{x+4} + 2$

$g(x) = (4/3)^{-(x+4)} + 2$

- reflect over y-axis
- reflect over x-axis
- shift left 4, up 2

b. $f(x) = 2^x$

$g(x) = -3/4(4)^{x+6} = -3/8 2^{2(x+6)}$

- reflect over x-axis
- horizontal shrink by 2
- vert. shrink by 3/8
- shift left 6

c. $f(x) = 4^x$

$g(x) = (2)^{x+8} - 11$

$g(x) = (4)^{1/2(x+8)} - 11$

- horiz. stretch by 1/2
- shift left 8
- down 11

8. For each of the following logistic functions state the requested information and sketch:

a. $f(x) = \frac{30}{1+5(0.4)^x} = \frac{30}{1+5(0.4)^x}$

Initial Value: $(0, 5)$

Limit to Growth: 30

Asymptotes: $y = 0$ & $y = 30$

D: $(-\infty, \infty)$ R: $(0, 30)$

$\lim_{x \rightarrow -\infty} f(x) = 0$

LEB:

REB: $x \rightarrow \infty$

b. $f(x) = \frac{120}{1+3(0.2)^x}$

Initial Value: $(0, 30)$

Limit to Growth: 120

Asymptotes: $y = 0$ & $y = 120$

D: $(-\infty, \infty)$ R: $(0, 120)$

$\lim_{x \rightarrow -\infty} f(x) = 0$

LEB:

REB: $x \rightarrow \infty$

c. $f(x) = \frac{198}{1+17(0.3)^x}$

Initial Value: $(0, 11)$

Limit to Growth: 198

Asymptotes: $y = 0$ & $y = 198$

D: $(-\infty, \infty)$ R: $(0, 198)$

$\lim_{x \rightarrow -\infty} f(x) = 0$

LEB:

REB: $x \rightarrow \infty$

