

Review Exercise Set 6

Exercise 1: Evaluate the exponential function at the given value.

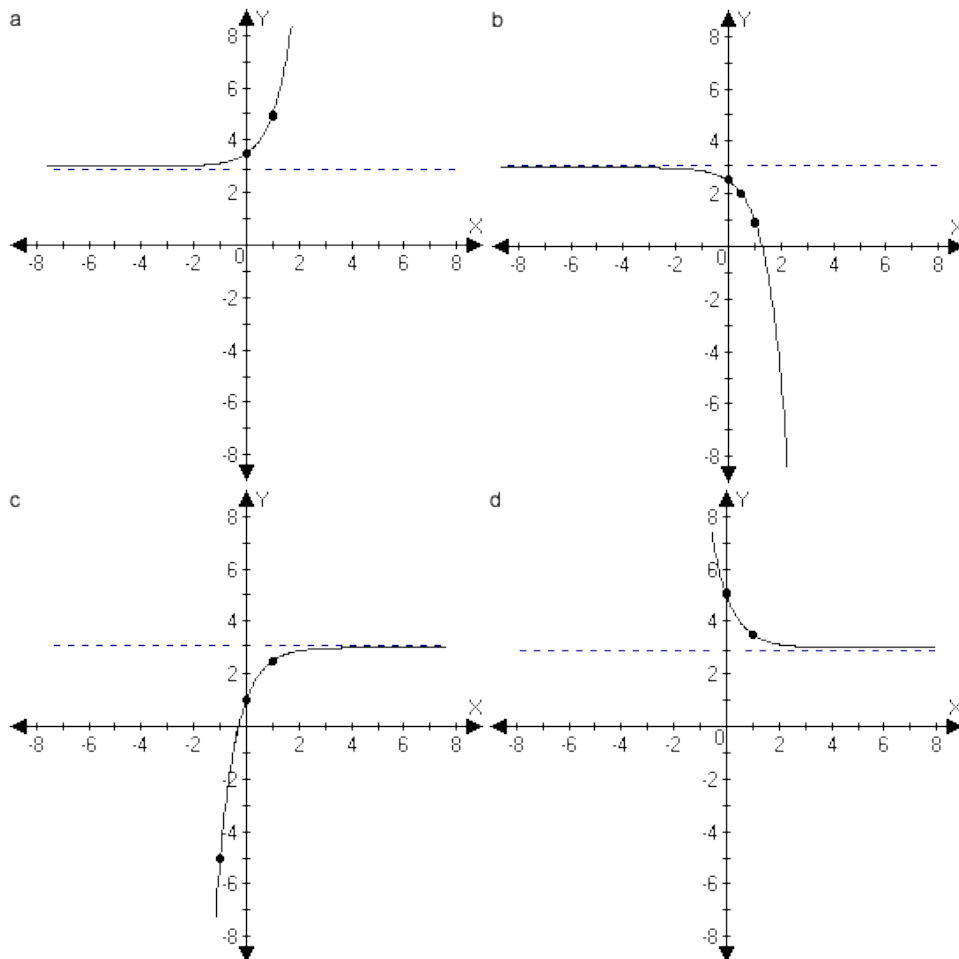
$$f(x) = -3^{2x-1}$$

a) $x = -2$

b) $x = \frac{1}{2}$

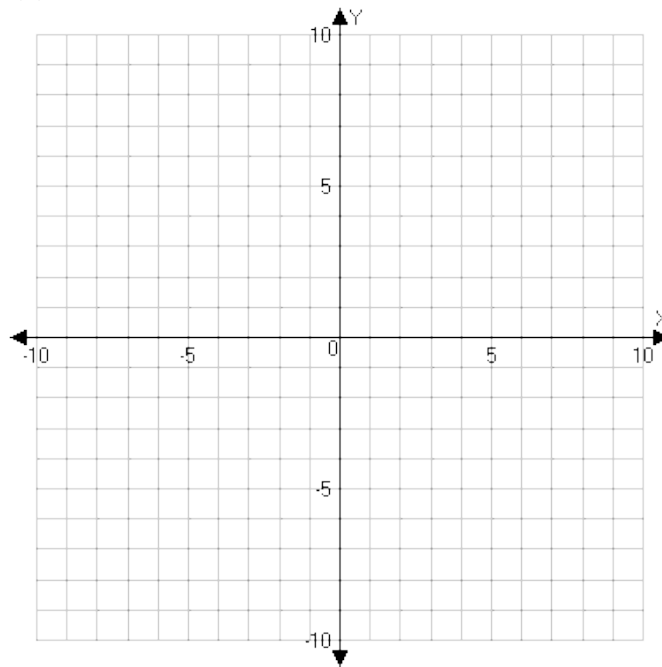
Exercise 2: Use transformation techniques to match the function with its graph.

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



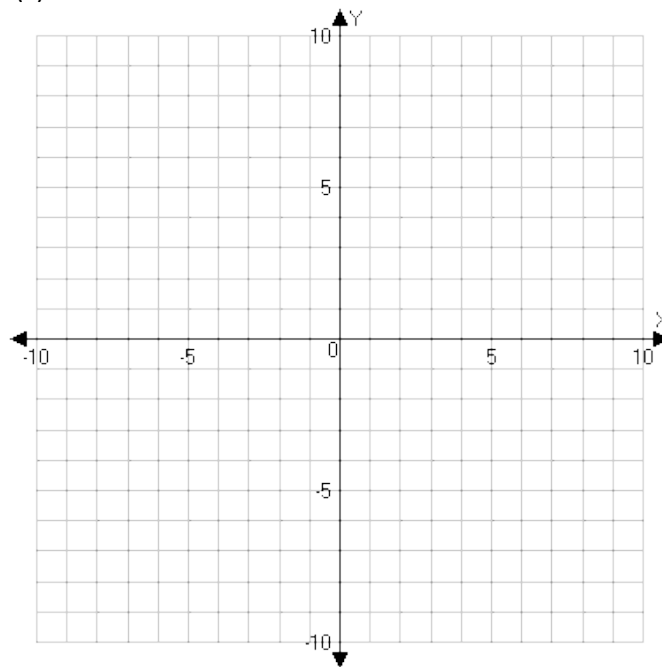
Exercise 3: Use transformation techniques to shift the horizontal asymptote and y-intercept of the base function.

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



Exercise 4: Use transformation techniques to shift the horizontal asymptote and y-intercept of the base function.

$$f(x) = 3 - 3^{x-2}$$



Exercise 5: If \$5,000 was deposited into an account paying 4% interest compounded quarterly, how much will be in the account in 6 years?

Review Exercise Set 6 Answer Key

Exercise 1: Evaluate the exponential function at the given value.

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

a) $x = -2$

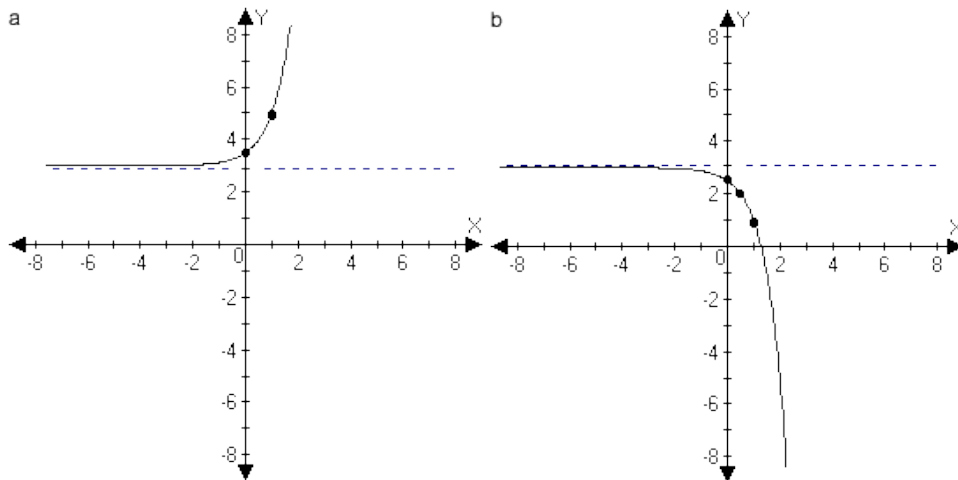
$$\begin{aligned} f(x) &= -3^{2x-1} \\ f(-2) &= -3^{2(-2)-1} \\ &= -3^{-4-1} \\ &= -3^{-5} \\ &= -\frac{1}{3^5} \\ &= -\frac{1}{243} \end{aligned}$$

b) $x = \frac{1}{2}$

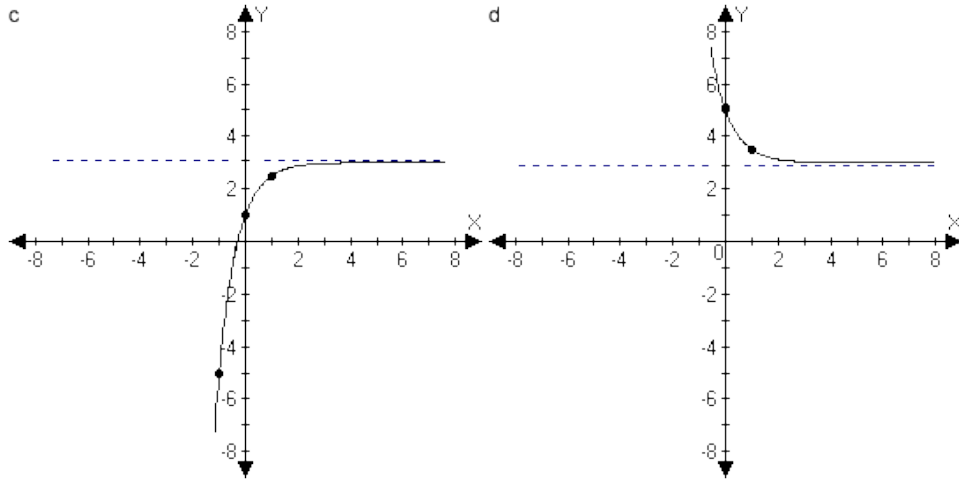
$$\begin{aligned} f(x) &= -3^{2x-1} \\ f\left(\frac{1}{2}\right) &= -3^{2\left(\frac{1}{2}\right)-1} \\ &= -3^{1-1} \\ &= -3^0 \\ &= -1 \end{aligned}$$

Exercise 2: Use transformation techniques to match the function with its graph.

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



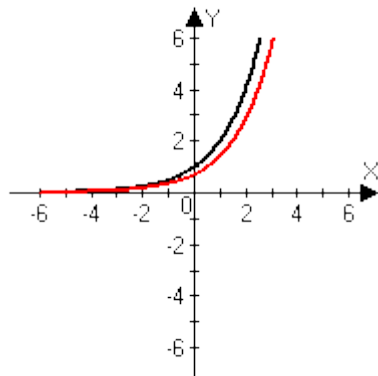
Exercise 2 (Continued):



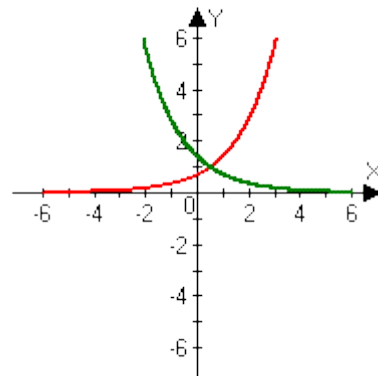
$f(x) = -2^{1-2x} + 3$ is graph c.

$$\begin{aligned} f(x) &= -2^{1-2x} + 3 \\ &= -2^{-2x+1} + 3 \\ &= -2^{-2(x+\frac{1}{2})} + 3 \\ &= -\left[2^{-2(x+\frac{1}{2})} - 3\right] \end{aligned}$$

Transformations of $f(x)$

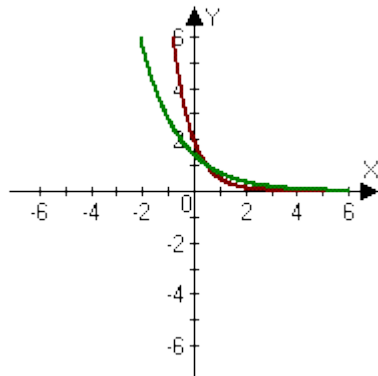


$f(x) = 2^x$
 $f(x) = 2^{x-1/2}$
 shift to the right $1/2$ unit



$f(x) = 2^{x-1/2}$
 $f(x) = 2^{-(x-1/2)}$
 reflect horizontally about $x = 1/2$

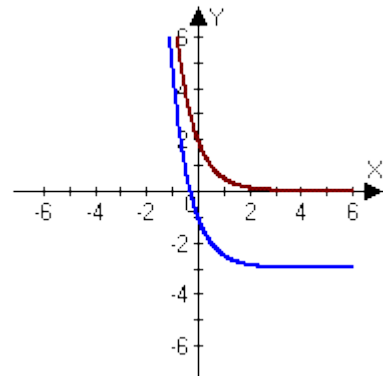
Exercise 2 (Continued):



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

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

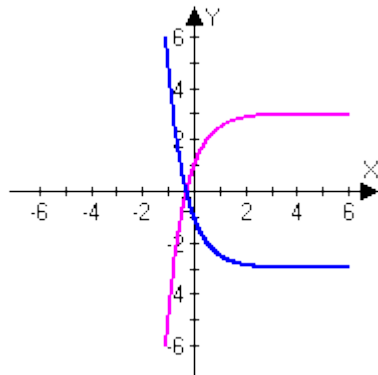
stretch vertically by factor of 2



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

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

shift down 3 units



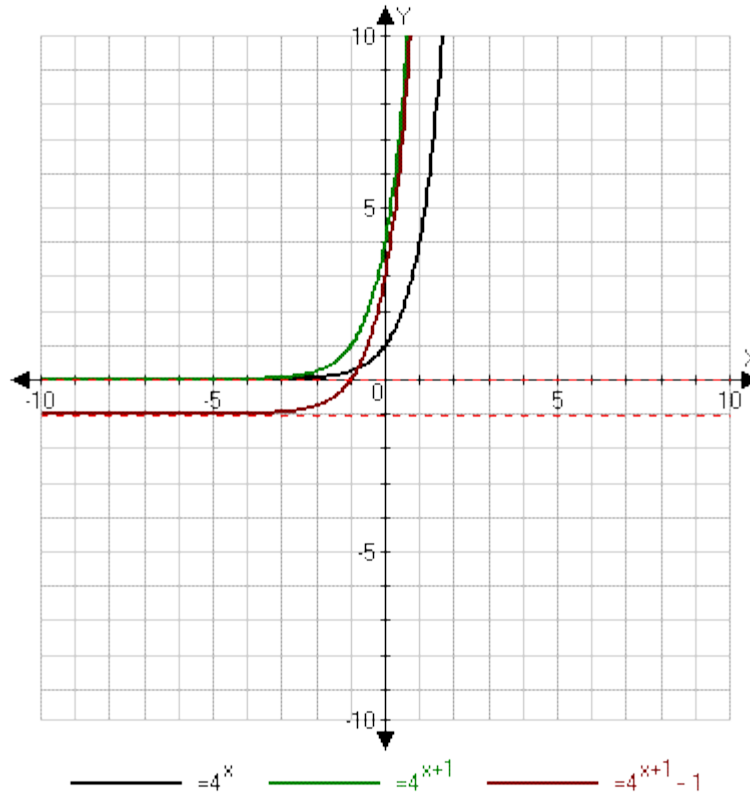
$$f(x) = 2^{-2(x-1/2)} - 3$$

$$f(x) = -[2^{-2(x-1/2)} - 3]$$

reflect vertically about x-axis

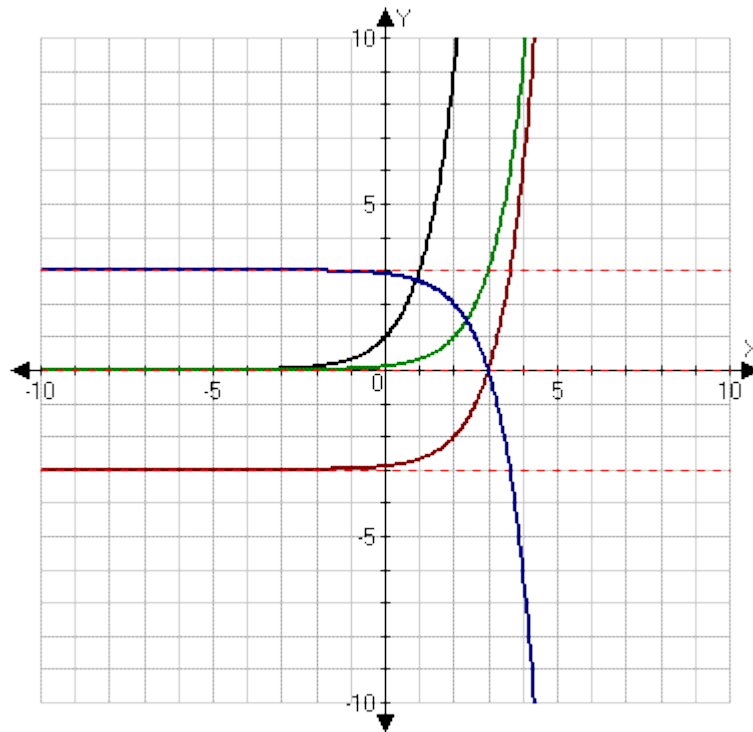
Exercise 3: Use transformation techniques to shift the horizontal asymptote and y-intercept of the base function.

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



Exercise 4: Use transformation techniques to shift the horizontal asymptote and y-intercept of the base function.

$$f(x) = 3 - 3^{x-2}$$
$$f(x) = -3^{x-2} + 3$$
$$f(x) = -[3^{x-2} - 3]$$



— $= 3^x$ — $= 3^{x-2}$ — $= 3^{x-2} - 3$ — $= -3^{x-2} - 3$

Exercise 5: If \$5,000 was deposited into an account paying 4% interest compounded quarterly, how much will be in the account in 6 years?

Identify given information

$$P = \$5,000$$

$$r = 4\% = 0.04$$

$$n = 4 \text{ (quarterly)}$$

$$t = 6$$

Substitute known values into the compound interest formula and solve for the unknown value.

$$A = P * (1 + r/n)^{nt}$$

$$A = 5000 * (1 + 0.04/4)^{4(6)}$$

$$A = 5000 * (1 + 0.01)^{24}$$

$$A = 5000(1.01)^{24}$$

$$A = 6348.67324$$

In 6 years there would be \$6,348.67 in the account.