Exercise 233
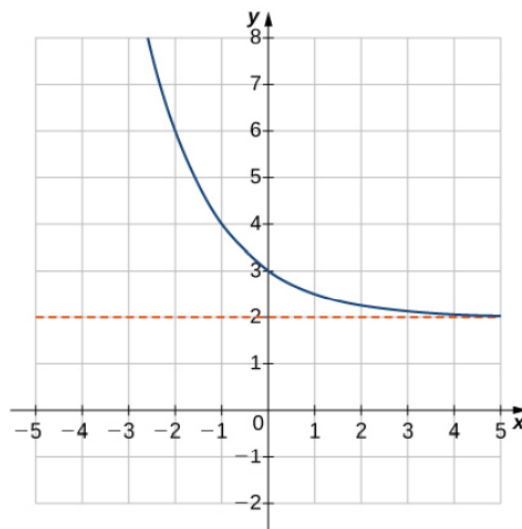
For the following exercises, match the exponential equation to the correct graph.

 a. $y = 4^{-x}$

 b. $y = 3^{x-1}$

 c. $y = 2^{x+1}$

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

 e. $y = -3^{-x}$

 f. $y = 1 - 5^{x}$

Solution

The equation corresponding to the given graph is d.,

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

Notice that at $x = 0$ the function has the value $y = 3$.

$$y(0) = \left(\frac{1}{2}\right)^{0} + 2 = 1 + 2 = 3$$

Also, notice that the function tends to $y = 2$ as x becomes large.

$$y = \underbrace{\left(\frac{1}{2}\right)^{x}}_{\approx 0 \text{ for large } x} + 2 \approx 2$$