7 CHAPTER REVIEW

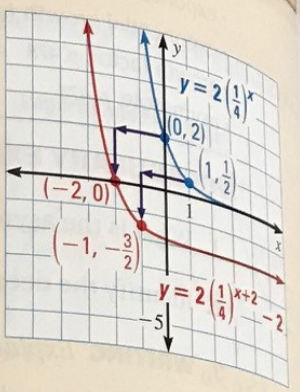
7.2 Graph Exponential Decay Functions

pp. 486–491

EXAMPLE

Graph $y = 2\left(\frac{1}{4}\right)^{x+2} - 2$. State the domain and range.

Begin by sketching the graph of $y = 2\left(\frac{1}{4}\right)^{x}$, which passes through $(0, 2)$ and $\left(1, \frac{1}{2}\right)$. Then translate the graph left 2 units and down 2 units. Notice that the translated graph passes through $(-2, 0)$ and $\left(-1, -\frac{3}{2}\right)$.



The graph's asymptote is the line $y = -2$. The domain is all real numbers, and the range is $y > -2$.

EXAMPLES 1, 2, and 3 on pp. 486–487 for Exs. 10–12

EXERCISES

Graph the function. State the domain and range.

10. $y = \left(\frac{1}{8}\right)^{x}$ **11.** $y = \left(\frac{1}{3}\right)^{x} - 4$ **12.** $f(x) = 2(0.8)^{x-1} + 3$

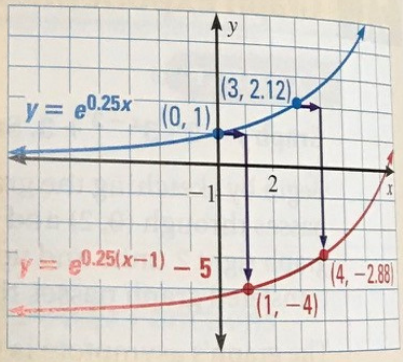
7.3 Use Functions Involving *e*

pp. 492–498

EXAMPLE

Graph $y = e^{0.25(x-1)} - 5$. State the domain and range.

Because $a = 1$ is positive and $r = 0.25$ is positive, the function is an exponential growth function. Begin by sketching the graph of $y = e^{0.25x}$. Translate the graph right 1 unit and down 5 units.



The domain is all real numbers, and the range is $y > -5$.

EXAMPLES 3 and 5 on pp. 493–495 for Exs. 13–16

EXERCISES

Graph the function. State the domain and range.

13. $y = 2e^{-x}$ **14.** $y = e^{x-2}$ **15.** $f(x) = e^{-0.4(x+2)} + 6$

16. PHYSIOLOGY Nitrogen-13 is a radioactive isotope of nitrogen used in a physiological test called positron emission tomograph (PET). A typical PET scan begins with 6.9 picograms of nitrogen-13 (1 picogram = 10^{-12} grams). The number N of picograms of nitrogen-13 remaining after t minutes can be modeled by $N = 6.9e^{-0.0695t}$. How many picograms of nitrogen-13 remain after 10 minutes?