

**UNIT 3 • LINEAR AND EXPONENTIAL FUNCTIONS****Lesson 5: Comparing Functions****Practice 3.5.3: Comparing Linear to Exponential Functions**

Use what you know about linear and exponential functions to complete problems 1–6.

1. Which increases faster,  $f(x) = 5x$  or  $g(x) = 5^x$ ? Justify your answer using a graph.
2. Which increases faster,  $f(x) = 2x - 4$  or  $g(x) = 2^x - 4$ ? Justify your answer using a table of values.
3. Which decreases faster,  $f(x) = 200(0.97)^x$  or  $g(x) = 200 - 3.6x$ ? Justify your answer using a graph.
4. Which decreases faster,  $f(x) = 1000(0.85)^x$  or  $g(x) = 1000 - 0.15x$ ? Justify your answer using a table of values.
5. At what point does the value of  $f(x)$  exceed the value of  $g(x)$  if  $f(x) = 2\left(8\right)^{\frac{x}{4}}$  and  $g(x) = 8x + 4$ ? Justify your answer with a graph.
6. At what point does the value of  $f(x)$  exceed the value of  $g(x)$  if  $f(x) = 500\left(1.035\right)^{\frac{x}{12}}$  and  $g(x) = 0.4x + 60$ ? Justify your answer with a graph.

Use the following information to answer questions 7–10.

You are looking to invest \$450. One savings option follows the function

$f(x) = 450 + 450(0.055)x$ , where  $f(x)$  is the amount of money in savings after  $x$  years.

The second option is represented by the function  $g(x) = 450\left(1 + \frac{0.04}{12}\right)^{12x}$ , where  $g(x)$  is the amount of money after  $x$  years.

7. Which increases faster,  $f(x) = 450 + 450(0.055)x$  or  $g(x) = 450\left(1 + \frac{0.04}{12}\right)^{12x}$ ? Use a graph to explain your answer.
8. At what point does the value of  $g(x)$  exceed the value of  $f(x)$ ?
9. If you were looking to invest your money for less than 10 years, which option would you choose? Explain your reasoning.
10. If you were looking to invest your money for more than 20 years, which option would you choose? Explain your reasoning.