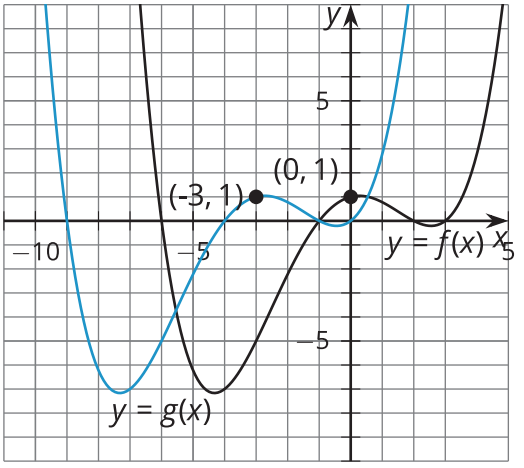
Lesson 3 Practice Problems

1. Here is a graph of f and a graph of g. Express g in terms of f using function notation.



2. Tyler leaves his house at 7:00 a.m. to go to school. He walks for 20 minutes until he reaches his school, 1 mile from his house. The function d gives the distance $d(t)$, in miles, of Tyler from his house t minutes after 7:00 a.m.

   a. Explain what $d(5) = 0.25$ means in this context.

   b. On snowy days, Tyler's school has a 2 hour delayed start time (120 minutes). The function s gives Tyler's distance $s(t)$, in miles, from home t minutes after 7:00 a.m. with a 120 minute delayed start time. If $d(5) = 0.25$, then what is the corresponding point on the function s?

   c. Write an expression for s in terms of d.

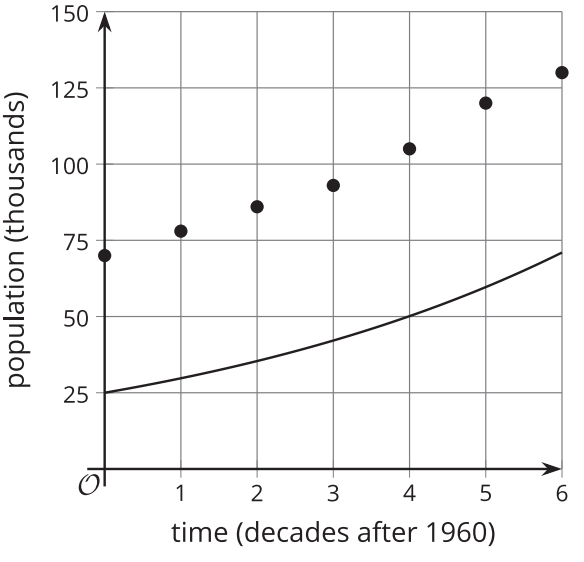
   d. A new function, n, is defined as $n(t) = d(t + 60)$ explain what this means in terms of Tyler's distance from school.

3. *Technology required.* Here are the data for the population f, in thousands, of a city d decades after 1960 along with the graph of the function given by $f(d) = 25 \cdot (1.19)^d$. Elena thinks that shifting the graph of f up by 50 will match the data. Han thinks that shifting the graph of f up by 60 and then right by 1 will match the data.

   a. What functions define Elena's and Han's graphs?

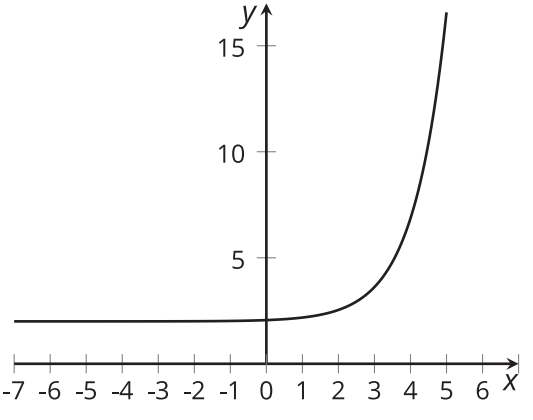
   b. Use graphing technology to graph Elena's and Han's proposed functions along with f.

   c. Which graph do you think fits the data better? Explain your reasoning.

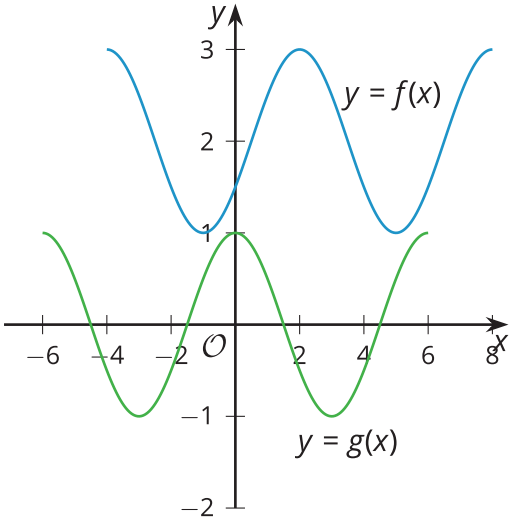


4. Here is a graph of $y = f(x + 2) - 1$ for a function f.

   Sketch the graph of $y = f(x)$.



5. Describe how to transform the graph of f to the graph of g:

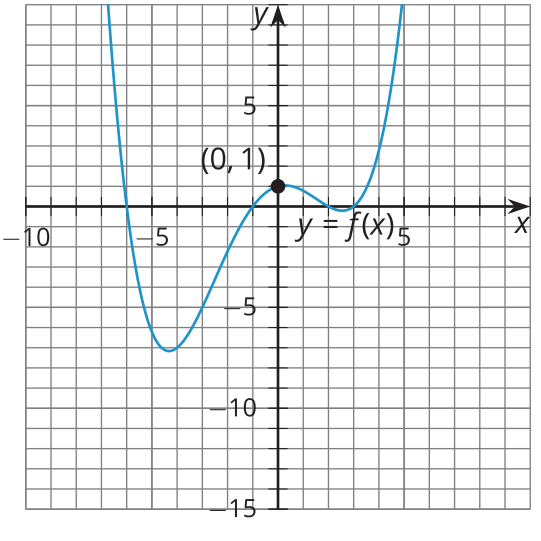


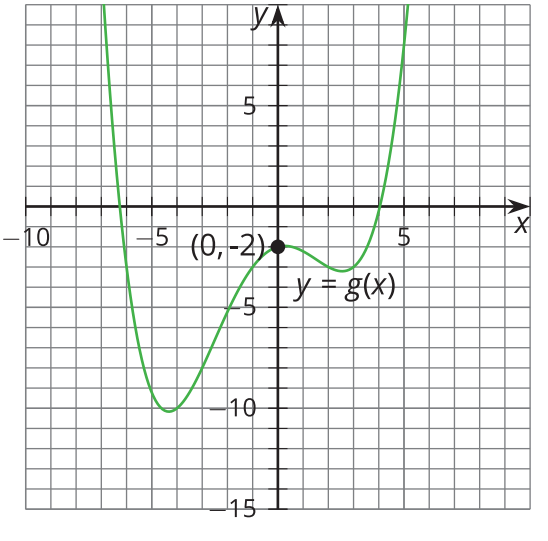
a. using only translations

b. using a reflection and a translation

(From Unit 5, Lesson 1.)

6. Here is a graph of function f and a graph of function g. Express g in terms of f using function notation.





(From Unit 5, Lesson 2.)