

Maintaining Mathematical Proficiency

Evaluating Expressions Involving Square Roots

Example 1 Evaluate $-4(\sqrt{121} - 16)$.

$$\begin{aligned} -4(\sqrt{121} - 16) &= -4(11 - 16) && \text{Evaluate the square root.} \\ &= -4(-5) && \text{Subtract.} \\ &= 20 && \text{Multiply.} \end{aligned}$$

Evaluate the expression.

- $7\sqrt{25} + 10$
- $-8 - \sqrt{\frac{64}{16}}$
- $5\left(\frac{\sqrt{81}}{3} - 7\right)$
- $-2(3\sqrt{9} + 13)$

Transforming Linear Functions

Example 2 Graph $f(x) = x$ and $g(x) = -3x - 4$. Describe the transformations from the graph of f to the graph of g .

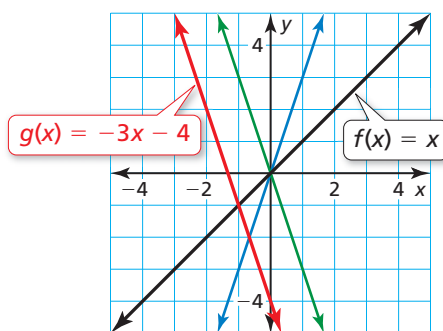
Note that you can rewrite g as $g(x) = -3f(x) - 4$.

Step 1 There is no horizontal translation from the graph of f to the graph of g .

Step 2 Stretch the graph of f vertically by a factor of 3 to get the graph of $h(x) = 3x$.

Step 3 Reflect the graph of h in the x -axis to get the graph of $r(x) = -3x$.

Step 4 Translate the graph of r vertically 4 units down to get the graph of $g(x) = -3x - 4$.



Graph f and g . Describe the transformations from the graph of f to the graph of g .

- $f(x) = x; g(x) = 2x - 2$
- $f(x) = x; g(x) = \frac{1}{3}x + 5$
- $f(x) = x; g(x) = -x + 3$
- ABSTRACT REASONING** Let a and b represent constants, where $b \geq 0$. Describe the transformations from the graph of $m(x) = ax + b$ to the graph of $n(x) = -2ax - 4b$.