Check In: Performing Operations on Functions

Answer all questions in the spaces provided.

1. Consider $f(x) = -6x + 1$ and $g(x) = x^2$.

   a. Determine $h(x) = f(x) + g(x)$, and find $h(3)$.

   b. Determine $m(x) = f(x) - g(x)$, and find $m(-1)$.

   c. Determine $p(x) = g(x) - f(x)$, and find $p(2)$.

   d. Determine $q(x) = f(x) \cdot g(x)$, and find $q(-3)$.

2. Use the table of values for $f(x)$ and $p(x)$ to find the given combinations of functions:

x	-3	-2	-1	0	1	2	3	4	5
$f(x)$	-5	-4	-3	-2	-1	0	1	2	3

x	-5	-4	-3	-2	-1	0	1	2	3
$p(x)$	15	6	-1	-6	-9	-10	-9	-6	-1

a. $(f + p)(3)$

b. $(f - p)(-2)$

c. $(p - f)(1)$

d. $(fp)(0)$

e. $(f + p)(5)$

f. $\left(\frac{f}{p}\right)(-1)$

g. $\left(\frac{p}{f}\right)(2)$

3. a. If $h(x) = (f - g)(x)$, find $f(x)$ if $g(x) = 4x - 3$ and $h(x) = 7x + 5$.

    b. If $h(x) = (fg)(x)$ find $f(x)$ if $g(x) = 2x - 3$ and $h(x) = 2x^2 - 7x + 6$.

4. Given $f(x) = x^2 - 3x - 10$ and $g(x) = (x + 2)(x - 3)$, graph $y = \left(\frac{f}{g}\right)(x)$.

State the domain and range of the combined function and any restrictions.

5. Given $f(x) = x - 3$ and $g(x) = x + 1$, graph $y = (f \cdot g)(x)$.

    a. State the zeros of the combined function.

    b. State the domain and range of the combined function and any restrictions.