Decompose the function:That is, find two functions f
and g, such that: h(x) = f(g(x)) where none are the y=x.

a. $h(x) = \sqrt{x+2} + 6$

b. $p(x) = (x+1)^2 - x - 1$

d. $g(x) = \dfrac{1}{(x+1)^2}$

a) $f(x) = x + 6$

$g(x) = \sqrt{x+2}$

OR/ $g(x) = x + 2$

$f(x) = \sqrt{x} + 6$
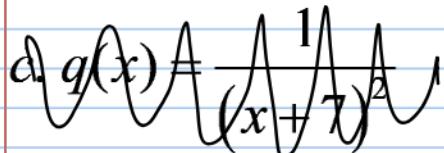
b) $f(x) = x - 1$

$g(x) = (x+1)^2 - x$

OR/ $f(x) = x^2 - x$

$g(x) = x + 1$

Use the graph to graph $h(x) = f(x) + g(x)$

| x	$h(x)$
2	3
1	1
0	$-1 + 0 = -1$
-1	$0 + 1 = 1$
-2	3
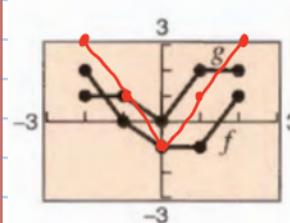
$h(2) = f(2) + g(2)$
$= 1 + 2$
$= 3$

$h(1) = f(1) + g(1)$
$= -1 + 2$
$= 1$

Use the graph to evaluate the functions
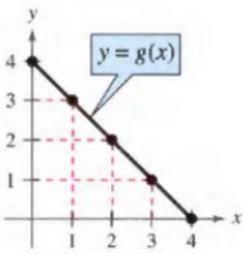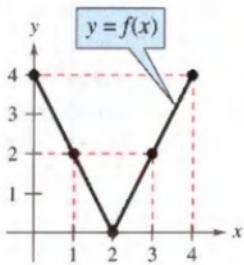
a. $f(1) + g(1) = 5$

b. $(f \circ g)(2) = f(g(2)) = f(2) = 0$

c. $(f \cdot g)(3) = f(3) \cdot g(3) = 2(1) = 2$

d. $\dfrac{f(4)}{g(4)} = \dfrac{4}{0} = \text{undefined}$

Error Analysis

A student found the product of two functions. Given f(x)=3x²+x-8 and g(x)=x-1.

Solution:

$f(x) \cdot g(x)=$ $(3x^2 + x - 8)(x - 1) =$

$= 3x^3 + x^2 - 8x - 3x^2 - x + 8$

$= 3x^3 - 4x^2 - 9x + 8$

The answer is $3x^3 - 4x^2 - 9x + 8$.

What is the error? Explain how to solve the problem correctly.