

PC-Lesson 1.4--Combinations of Functions

$$\text{Let } f(x) = 2x - 3 \text{ and } g(x) = x^2 - 1$$

Find:

$$(a) \quad (f + g)(x) \rightarrow f(x) + g(x) =$$

$$(b) \quad (f - g)(x) \rightarrow f(x) - g(x) =$$

Combinations of Functions--Multiplication & Division

$$\text{Let } f(x) = 2x - 3 \text{ and } g(x) = x^2 - 1$$

Find:

$$(c) \quad (f \cdot g)(x) \quad \rightarrow \quad f(x) \cdot g(x) \quad =$$
$$=$$

$$(d) \quad \frac{f(x)}{g(x)} \quad \rightarrow \quad \frac{f(x)}{g(x)} \quad =$$

Composition of Functions



$$\text{Let } f(x) = 2x - 3 \text{ and } g(x) = x^2 - 1$$

Find:

(e) $(f \circ g)(x) =$ 

(f) $(g \circ f)(x) =$ 

(g) $(f \circ g)(3) =$ 

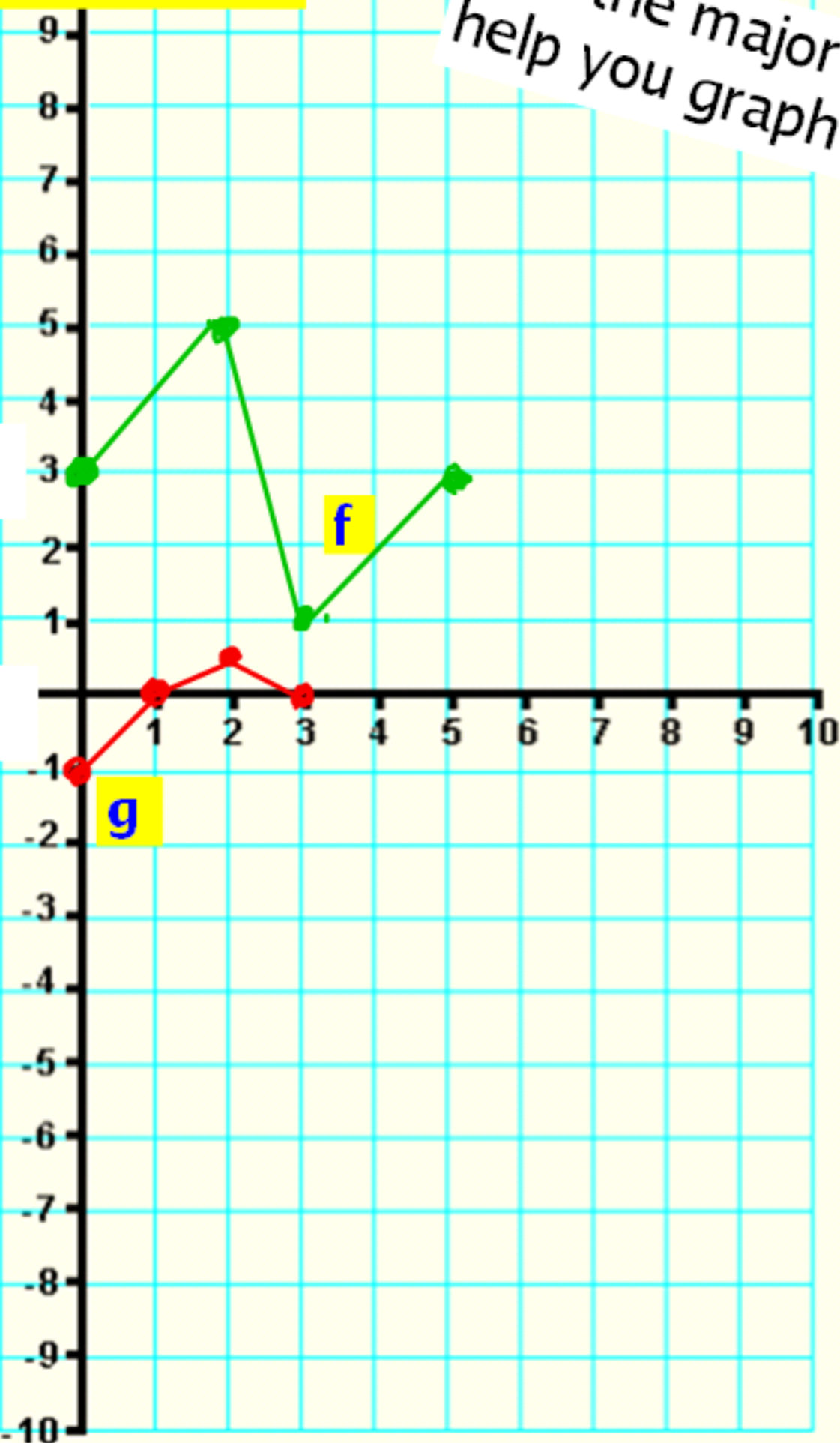
 $g(3) = ??$ 

1.4 example like # 23

Graph $h(x) = (f + g)(x)$

Use the major pts to help you graph $(f+g)(x)$

$(f+g)(x) = f(x) + g(x)$ so...



Ask this first

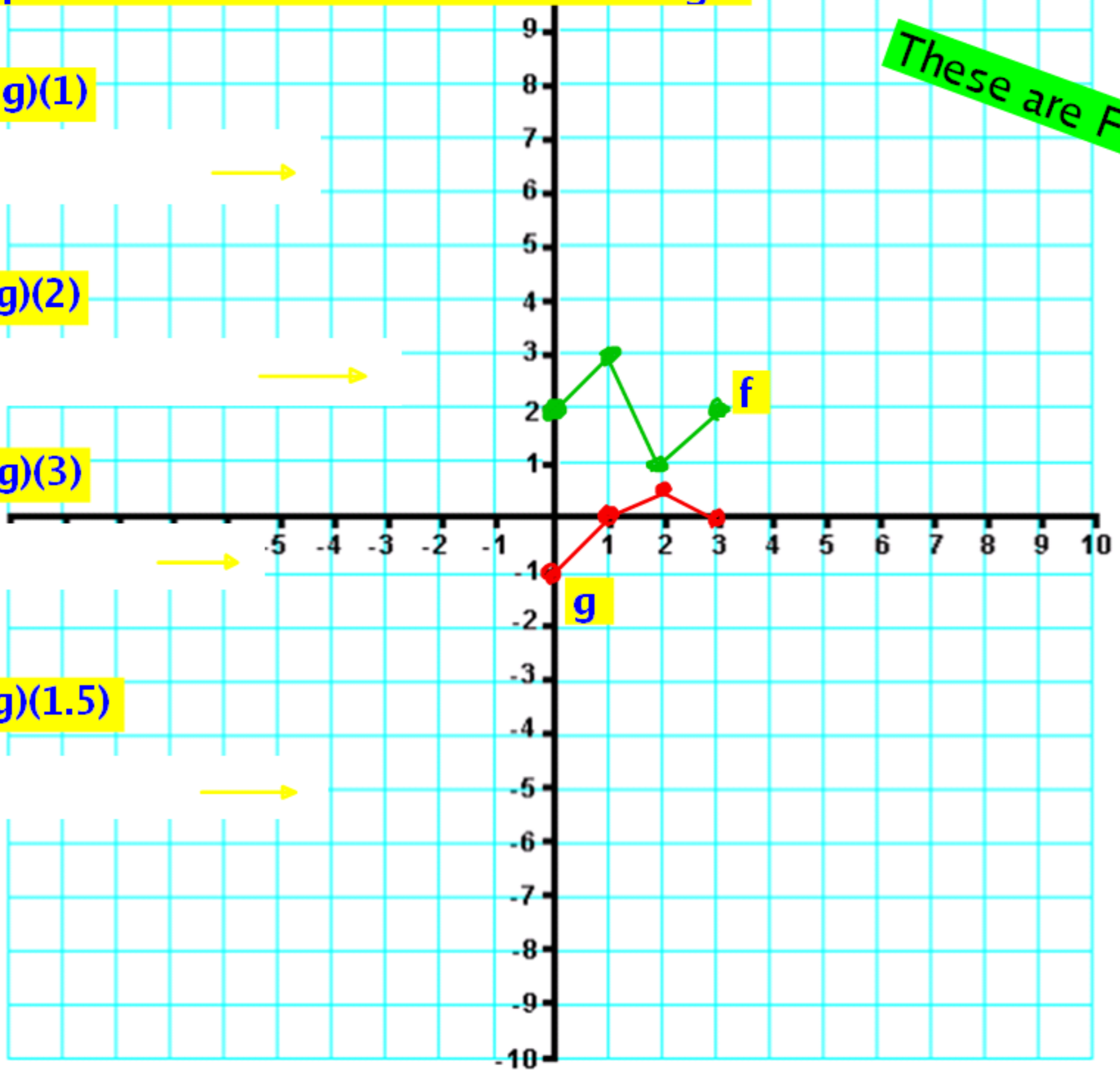
1.4 example like # 51+...Evaluate the following

Find $(f \circ g)(1)$

Find $(f \circ g)(2)$

Find $(f \circ g)(3)$

Find $(f \circ g)(1.5)$



These are F-U-N!

Express $h(x) = (3x-5)^3$ as a composition of 2 functions...

Look for an "inner" and an "outer" function.

If $g(x) = 3x - 5$ and $f(x) = x^3$ then...

$$\begin{aligned}h(x) &= [f \circ g](x) = (3x-5)^3 \\ &= f[g(x)]\end{aligned}$$

What about $h(x) = \frac{1}{(x-2)^2}$

$$g(x) = x-2; \quad f(x) = \frac{1}{x^2} \quad \rightarrow \rightarrow \quad h(x) = [f \circ g](x)$$

or...

Let $g(x)=(x-2)^2$ and $f(x)=1/x$

Then $h(x)=1/g(x) = [f \circ g](x)$

Soooo, there is more than one possible answer to some of these type questions!

Ex5: Let $f(x)=\sqrt{x}$, $x \geq 0$ and $g(x)=x-1$, $x \geq 1$

Find

(a) $[f \circ g](x)$

(b) $[f \circ g](2)$

(c) $[f \circ g](0)$

Also note... $f \circ g \neq g \circ f$

(i.e., composition of functions is NOT commutative!)