

Clive On Function Notation

Clive is tackling his functions homework and knows that he's made mistakes somewhere.

Can you spot and correct the mistakes Clive has made?

Can you explain what mistakes Clive has made, and maybe give him some tips so that he (hopefully) doesn't make them again?

Question 1:

If $f(x) = 3x - 2$, find:

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

Clive's answer:

Substitute $x = 2$.

Answer:

$$f(2) = 4$$

$$\text{Therefore } f(-2) = -4$$

Your answer:

What mistake has Clive made?

Question 2:

Find $g^{-1}(x)$ if $g(x) = 5x + 3$.

Clive's answer:

$g^{-1}(x)$ is the inverse of $g(x)$.

$$y = 5x + 3$$

$$\frac{y}{5} = x + 3$$

$$\frac{y}{5} - 3 = x$$

Answer:

$$g^{-1}(x) = \frac{x}{5} - 3$$

Your answer:

What mistake has Clive made?

<u>Question 3:</u> $f(x) = 2x + 1$ $g(x) = \frac{5}{x + 3}$ Find $fg(7)$	
<i>Clive's answer:</i>	<i>Your answer:</i>
$f(7) = 2 \times 7 + 1 = 15$ Substitute this answer in to $g(x)$: $g(15) = \frac{5}{15 + 3}$ <i>Answer:</i> $fg(7) = \frac{5}{18}$	
What mistake has Clive made?	
<u>Question 4:</u> Given that $h(x) = 2x^2 - 3$, find $h^{-1}(1)$. Leave your answer as a surd.	
<i>Clive's answer:</i>	<i>Your answer:</i>
Find the inverse of $h(x)$: $y = 2x^2 - 3$ $y + 3 = 2x^2$ $\sqrt{y + 3} = 2x$ $h^{-1}(x) = \frac{\sqrt{x + 3}}{2}$ Substitute $x = 1$ in to $h^{-1}(x)$: $h^{-1}(1) = \frac{\sqrt{1 + 3}}{2} = \frac{\sqrt{4}}{2}$ <i>Answer:</i> 1	
What mistake has Clive made?	