Please do not write in the margins of the page!

Part A: Use the "round-trip" theorem to check if the given functions are inverses: show **all** your work.

1) $f(x) = -x - 4$; $g(x) = 4 - x$

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

$$
\begin{aligned}
f(g(x)) = f(4 - x) \\
= -(4 - x) - 4 \\
= -4 + x - 4 = x - 8 \neq x
\end{aligned}
$$

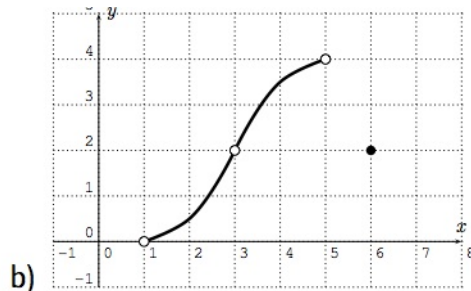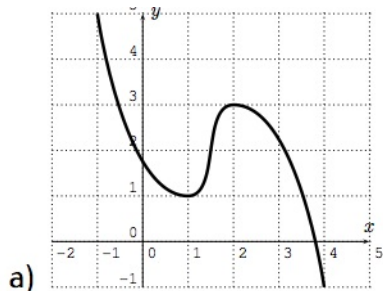No they are not inverses. (You could also check to see if $g \circ f(x) = x$: it is not.)

2) $f(x) = 2x + 3$; $g(x) = x - \frac{3}{2}$
   Is $f \circ g(x) = x$?

$$
\begin{aligned}
f(g(x)) = f\left(x - \frac{3}{2}\right) \\
= 2\left(x - \frac{3}{2}\right) + 3 \\
= 2x - 2\left(\frac{3}{2}\right) + 3 \\
= 2x - 3 + 3 = 2x \neq x
\end{aligned}
$$

No, they are not inverses. (You could also check to see if $g \circ f(x) = x$: it is not.)

Part B: Is each of the functions whose graphs are given below one-to-one or not? Explain your answer.

a)

b)

a) Is it one-to-one? Why or why not?
   No: for example, there is more than one input x that gives the output 2 (a horizontal line $y = 2$ intersects the graph in 3 points).

b) Is it one-to-one? Why or why not?
   Yes: every output comes from only one input (any horizontal line will intersect this graph in at most one point).