8. Use the graphs of \( f \) and \( g \) to evaluate each of the functions below.

\[
\text{\( y = f(x) \)}
\]
\[
\text{\( y = g(x) \)}
\]

\[
(a) \quad (f + g)(3) = f(3) + g(3) = 2 + 1 = 3
\]

\[
(b) \quad (g \circ f)(4) = g(f(4)) = g(1) = 3
\]

\[
(c) \quad (f \circ g)(4) = f(g(4)) = f(2) = 0
\]

\[
(d) \quad (f \circ f)(0) = f(f(0)) = f(4) = 1
\]

9. Find the inverse of \( f(x) = \frac{x+3}{x-2} \) (you do NOT need to verify that your result is the inverse - the last step in finding an inverse).

\[
y = \frac{x+3}{x-2}
\]

\[
x = \frac{y+3}{y-2}
\]

\[
(y-2)x = y + 3
\]

\[
xy - 2x - y = 3
\]

\[
y = \frac{2x+3}{x-1}
\]

so

\[
f^{-1}(x) = \frac{2x+3}{x-1}
\]

10. Show that \( f \) and \( g \) are inverse functions using the Definition of Inverse Function (algebraically).

\[
f(x) = 3 - 4x, \quad g(x) = \frac{3-x}{4}
\]

\[
s(f(g(x))) = f(\frac{3-x}{4}) = 3 - 4\left(\frac{3-x}{4}\right) = 3 - (3-x) = 3 - 3 + x = x
\]

\[
g(f(x)) = g(3-4x) = 3 - (3-4x) = 3 - 3 + 4x = \frac{4x}{4} = x
\]

\[
\text{\( g \) is the inverse of \( f \)}
\]

\[
\text{\( g \preceq f^{-1}(x) \) for only one direction}
\]