Q1: \( f, g \) both \( 1-1 \).

\( f + g \) need not be \( 1-1 \).

example \( f = x \), \( g = -x \).

\( f + g \) need not be \( 1-1 \).

\( f(x) = x \) on \([1, 2]\) \( g(x) = \frac{1}{x} \) on \((1, 2)\).

\( f + g \) will be \( 1-1 \).

\( f + g (x_1) = f + g (x_2) \)

\( \Rightarrow f(g(x_1)) = f(g(x_2)) \) by def.

\( \Rightarrow g(x_1) = g(x_2) \) by \( f \) is \( 1-1 \).

\( \Rightarrow x_1 = x_2 \) by \( g \) is \( 1-1 \).

\( f, g \) both \( 1-1 \).

\( f + g \) need not be \( 1-1 \) \( f + g \) need not be same example as above.

\( f: X \rightarrow Y \; g: Z \rightarrow X \).

\( f \circ g \; Z \rightarrow Y \) Let \( y \in Y \).

\( f \) is onto \( \Rightarrow \exists x \in X \) s.t. \( f(x) = y \).

\( g \) is onto \( \Rightarrow \exists z \in Z \) s.t. \( g(z) = x \).

then \( f \circ g (z) = f(g(z)) = y \)
Q2. \( f \circ g \) is 1-1 \( \Rightarrow \) \( g \) is 1-1.

But \( g \) is 1-1 \( \Rightarrow \) \( f \circ g \) is 1-1.

Example.

\( f \circ g \) is 1-1 \( \Rightarrow \) \( g \) is 1-1.

Example.

Q3. \( f \circ g \) is onto \( \Rightarrow \) \( f \) is onto.

But \( f \) is onto \( \Rightarrow \) \( f \circ g \) is onto.

Example.

and \( f \circ g \) is onto \( \Rightarrow \) \( g \) is onto.

Example. Same as last.

Q4. \( f, g \) even \( \Rightarrow \) \( f + g \) is even.

\( f, g \) odd \( \Rightarrow \) \( f + g \) is odd.

\( f \) even \( \Rightarrow \) \( f \) even \( \Rightarrow \) \( f \) is even.

\( f, g \) odd \( \Rightarrow \) \( f, g \) even \( \Rightarrow \) \( f + g \) can be anything.

\( f \) even \( \Rightarrow \) \( g \) odd \( \Rightarrow \) \( \log \) is 1-1.

\( f \) even \( \Rightarrow \) \( g \) odd \( \Rightarrow \) \( \log \) is 1-1.
\[ \text{Solve, S. odd} \quad \log(-x) = \int f(s(-x)) \, ds(-x) \]

\[ = \int f(s(x)) \, ds(x) \]

\[ = -\int f(s(x)) \, ds(x) = 0. \]

\[ Q \]

5. \[ y = \frac{2x+1}{x-1} \quad x \neq 1. \]

\[ y(x-1) = 2x+1. \]

5. \( y(x-2) = 1+y \)

\[ x = \frac{1+y}{y-2} \quad y \neq 2. \]

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

Check other way:

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