1. Simplify the expression $\frac{2}{2x+1} - \frac{x}{x^2+1}$

Solution:

$$\frac{2}{2x+1} - \frac{x}{x^2+1} = \frac{2(x^2+1)}{(2x+1)(x^2+1)} - \frac{x(2x+1)}{(x^2+1)(2x+1)}$$

$$= \frac{2x^2 + 2 - (2x^2 + x)}{(x^2+1)(2x+1)}$$

$$= \frac{2x^2 + 2 - (2x^2 + x)}{(x^2+1)(2x+1)}$$

$$= \frac{2 - x}{(x^2+1)(x+1)}$$

2. Solve the equation $\frac{1-x}{1+x} = 3$.

Solution: The equation can be written as $\frac{1-x}{1+x} = 3$. So it is same as

$$(1-x) \cdot 1 = (1+x) \cdot 3$$

$$1 - x = 3 + 3x$$

$$1 - 3 = 3x + x$$

$$-2 = 4x$$

$$\frac{-2}{4} = x$$

So the solution is $x = -\frac{1}{2}$.

3. In the script we mentioned $\frac{1}{a} + \frac{1}{b} \neq \frac{1}{a+b}$. Find the correct formula of writing $\frac{1}{a} + \frac{1}{b}$ as a single fraction.

Solution:

$$\frac{1}{a} + \frac{1}{b} = \frac{b}{ab} + \frac{a}{ab}$$

$$= \frac{a+b}{ab}$$
4. Find the equation of the line passing through the point \((-2, 3)\) and is parallel to the line \(y = 4x + 5\).

Solution: The given line \(y = 4x + 5\) has slope 4, so the line we want to find also has slope \(m = 4\). It passes through \((-2, 3)\), so the equation is

\[
y - 3 = 4(x + 2)
\]

It can also be written as

\[
y = 4(x + 2) + 3
\]

or

\[
y = 4x + 11
\]