

Solve the equation

$$-\frac{\log(x)}{\log(10)} + \frac{\log\left(\frac{x+8}{x-1}\right)}{\log(10)} = 0$$

Rewrite the equation as

$$\frac{1}{\log(10)} \left(-\log(x) + \log\left(\frac{x+8}{x-1}\right) \right) = 0$$

Solve the equation

$$-\log(x) + \log\left(\frac{x+8}{x-1}\right) = 0$$

Rewrite the equation as

$$\log\left(\frac{x+8}{x-1}\right) = \log(x)$$

Therefore we get

$$\frac{x+8}{x-1} = x$$

Solve the equation

$$-x + \frac{x+8}{x-1} = 0$$

Rewrite the equation as

$$\frac{1}{x-1} (-x(x-1) + x+8) = 0$$

Solve the equation

$$-x(x-1) + x+8 = 0$$

Rewrite the equation as

$$-x^2 + 2x + 8 = 0$$

This equation is quadratic The discriminant is

$$D = 36$$

Use the formulas

$$x = \frac{-2 + \sqrt{36}}{-1 \cdot 2}$$

$$x = \frac{-6 - 2}{-1 \cdot 2}$$

Therefore the roots of this quadratic equation are

$$x = -2$$

$$x = 4$$