

Exercise 51

Solve each equation for x .

(a) $e^{7-4x} = 6$

(b) $\ln(3x - 10) = 2$

Solution**Part (a)**

$$e^{7-4x} = 6$$

Take the natural logarithm of both sides.

$$\ln e^{7-4x} = \ln 6$$

Bring the exponent down in front.

$$(7 - 4x) \ln e = \ln 6$$

Use the fact that $\ln e = 1$.

$$7 - 4x = \ln 6$$

$$4x = 7 - \ln 6$$

Therefore,

$$x = \frac{1}{4}(7 - \ln 6) \approx 1.302.$$

Part (b)

$$\ln(3x - 10) = 2$$

Exponentiate both sides.

$$e^{\ln(3x-10)} = e^2$$

$$3x - 10 = e^2$$

$$3x = 10 + e^2$$

Therefore,

$$x = \frac{1}{3}(10 + e^2) \approx 5.796.$$