Exercise 283

For the following exercises, solve the exponential equation exactly.

$$7^{3x-2} = 11$$

Solution

Take the logarithm of both sides.

$$\ln 7^{3x-2} = \ln 11$$

Use the property of logarithms that allows the exponent to be brought down in front.

$$(3x-2)\ln 7 = \ln 11$$

Solve for x.

$$3x - 2 = \frac{\ln 11}{\ln 7}$$

$$3x = 2 + \frac{\ln 11}{\ln 7}$$

$$x = \frac{1}{3}\left(2 + \frac{\ln 11}{\ln 7}\right) \approx 1.08$$