## Exercise 282

For the following exercises, solve the exponential equation exactly.

$$4 \cdot 2^{3x} - 20 = 0$$

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**Solution**

Isolate the term with the variable in the exponent.

$$4 \cdot 2^{3x} = 20$$

Divide both sides by 4.

$$2^{3x} = 5$$

Take the logarithm of both sides.

$$\ln 2^{3x} = \ln 5$$

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

$$3x \ln 2 = \ln 5$$

Solve for $x$.

$$x = \frac{\ln 5}{3 \ln 2} \approx 0.774$$