14.6) Solving equations using logarithms

Worked example

Solve the equation:

$$2^x = 30$$

$$5^x = 0.1$$

Your turn

Solve the equation:

$$3^x = 20$$

$x = 2.727$ (3 dp)

Worked example

Solve the equation:

$$4^{5x-1} = 71$$

$$3^{1-4x} = 17$$

Your turn

Solve the equation:

$$5^{4x-1} = 61$$

$x = 0.889$ (3 dp)

Worked example

Solve the equation:

$$2^x = 3^{x+1}$$

Your turn

Solve the equation:

$$3^x = 2^{x+1}$$

$x = 1.7095$ (4 dp)

Worked example

Solve the equation:

$$3^{2x} - 9(3^x) + 14 = 0$$

Your turn

Solve the equation:

$$5^{2x} - 15(5^x) + 20 = 0$$

$x = 1.43, x = 0.431$ (3 sf)

Worked example

Solve the equation:

$$3^x 2^{x+1} = 7$$

Give your answer in exact form

Your turn

Solve the equation:

$$2^x 3^{x+1} = 5$$

Give your answer in exact form

$$x = \frac{\log 5 - \log 3}{\log 6}$$

Worked example

Solve the equation:

$$2^{x-1} = 5^{x+1}$$

Round your answer to 3 decimal places

Your turn

Solve the equation:

$$3^{x+1} = 4^{x-1}$$

Round your answer to 3 decimal places

$x = 8.638$ (3 dp)