4.5 Exponential and logarithmic equations

EXAMPLES Find the solution, exact solution first, then approximate to three decimal places.

1. \(3^{2x-1} = 5\)

2. \(4(1 + 10^{2x}) = 9\)

3. \(e^{3-5x} = 16\)

4. \(7^{x/2} = 5^{1-x}\)

5. \(e^{2x} - e^x - 6 = 0\)

6. \(x^2 e^x + xe^x - e^x = 0\)
EXAMPLES Solve for $x$.

1. $\ln(2 + x) = 1$

2. $2 \log x = \log 2 + \log(3x - 4)$

3. $\log_3(x + 15) - \log_3(x - 1) = 2$

4. $\ln(x - 1) + \ln(x + 2) = 1$

EXAMPLE A woman invests $6500 in an account that pays 6% interest per year, compounded continuously. How long will it take for the amount to be $8000?

EXAMPLE How long will it take for an investment of $1000 to double in value if the interest rate is 8.5% per year, compounded continuously?