Exponential and Logarithmic Equations

1. Solve each exponential equation by expressing each side as a power of the same base and then equating exponents
(similar to p.456 #2)

$$2^x = 16$$

2. Solve each exponential equation by expressing each side as a power of the same base and then equating exponents
(similar to p.456 #8)

$$3^{5x-1} = 9$$

3. Solve each exponential equation by expressing each side as a power of the same base and then equating exponents
(similar to p.456 #10)

$$9^{x+2} = 27$$

4. Solve each exponential equation by expressing each side as a power of the same base and then equating exponents
(similar to p.456 #18)

$$5^x = \frac{1}{\sqrt[4]{5}}$$

5. Solve each exponential equation by expressing each side as a power of the same base and then equating exponents
(similar to p.456 #20)

$$16^{x-2} = 8^{3x-1}$$

6. Solve each exponential equation. Express the solution set in terms of natural logarithms. Then use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution
(similar to p.457 #28)

$$15^x = 112$$

7. Solve each exponential equation. Express the solution set in terms of natural logarithms. Then use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution
(similar to p.457 #36)

$$e^{7x-1} - 5 = 53$$

8. Solve each exponential equation. Express the solution set in terms of natural logarithms. Then use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution
(similar to p.457 #38)

$$4^{x-7} = 13$$

9. Solve each exponential equation. Express the solution set in terms of natural logarithms. Then use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution
(similar to p.457 #42)

$$2^{8x-1} = 3^{x-4}$$

10. Solve each exponential equation. Express the solution set in terms of natural logarithms. Then use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution
(similar to p.457 #46)

$$e^{4x} - 8e^{2x} - 20 = 0$$

11. Solve each logarithmic equation. Be sure to reject any value of x that is not in the domain of the original log expressions. Give the exact answer. Then, where necessary, use a calculator to obtain a decimal approximation correct to 2 decimal places
(similar to p.457 #54)

$$\log_4(x-5) = 3$$

12. Solve each logarithmic equation. Be sure to reject any value of x that is not in the domain of the original log expressions. Give the exact answer. Then, where necessary, use a calculator to obtain a decimal approximation correct to 2 decimal places
(similar to p.457 #60)

$$5\ln(3x-1)=15$$

13. Solve each logarithmic equation. Be sure to reject any value of x that is not in the domain of the original log expressions. Give the exact answer. Then, where necessary, use a calculator to obtain a decimal approximation correct to 2 decimal places
(similar to p.457 #68)

$$\log_2 x + \log_2(x-6) = 4$$

14. Solve each logarithmic equation. Be sure to reject any value of x that is not in the domain of the original log expressions. Give the exact answer. Then, where necessary, use a calculator to obtain a decimal approximation correct to 2 decimal places
(similar to p.457 #70)

$$\log_3(x-1) - \log_3(x-5) = 2$$

15. Solve each logarithmic equation. Be sure to reject any value of x that is not in the domain of the original log expressions. Give the exact answer. Then, where necessary, use a calculator to obtain a decimal approximation correct to 2 decimal places
(similar to p.457 #82)

$$\log(x+1) - \log 5 = \log(4x-2)$$

16. Solve each logarithmic equation. Be sure to reject any value of x that is not in the domain of the original log expressions. Give the exact answer. Then, where necessary, use a calculator to obtain a decimal approximation correct to 2 decimal places
(similar to p.457 #90)

$$\ln(x+2) - \ln(x+4) = \ln(x+7) - \ln(x+11)$$