Math 120 **Lesson 4-6**

Exponential Equations

Topics

1) Solve exponential equations using like bases.
2) Solve exponential equations using logs.
3) Solve exponential equations in quadratic form.
4) Solve applied problems.

1) Solve exponential equations using like bases.

FACT: If $b^x = b^y$ then $x = y$.

Solve the following equations.

a) $2^{3x-8} = 16$ b) $27^{x+3} = 9^{x-1}$ c) $e^{x+4} = \frac{1}{e^{2x}}$ d) $9^x = 27$

2) Solve exponential equations using logs.

FACT: If $M = N$ then $\ln M = \ln N$.

OR

To solve exponential equations using logs:
1) Isolate the base with the exponent.
2) Take logs of both sides.
3) Use log properties to get the exponent with the variable down onto the base-line.
4) Solve.
5) Leave an exact solution unless instructed to round.

Exponential Equations

Solve the following equations.

a) $4^x = 15$ b) $10^x = 120000$ c) $40e^{0.6x} - 3 = 237$ d) $5^{x-2} = 4^{2x+3}$

3) Solve exponential equations in quadratic form.

Solve. a) $e^{2x} - 4e^x + 3 = 0$ b) $e^{2x} - 8e^x + 7 = 0$

4) Solve applied problems.

If Emery has $1700 to invest at 12% per year compounded monthly, how long will it be before he has $2500? If the compounding is continuous, how long will it be? (Round your answers to three decimal places.)