U6D3- Exponential Equations Part 1

Tuesday, December 5, 2017 10:57 AM



Unit 6 lesson 3-T...

MAP 4CI: Unit 6 Algebraic Models Lesson 3 – Exponential Equations Part 1

Definition of an Exponential Equation: An equation that contains the variable in the exponent:

Example
$$2^x = 32$$

To solve the equation you must find a value of "x" that makes this equation true

Methods to Solve

- 1. Common Base: look for a common base on both sides of the equation and solve for the unknown.
- 2. Systematic Trial: start with an estimate and using an iterative process continue to improve the estimated answer.
- 3. Graphing: Graph the relationship and estimate the answer from the graph.
- 4. Logarithms: Use logarithms to determine the exact answer (not covered in this course).

Unit 6 Lesson 3 (Continued)

Method #1 : Common Base

Looking for a common base:

Express each number as a power

a. 8 as a power of 2.

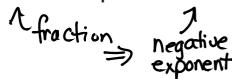
$$\lambda^3 = 8$$

b. 81 as a power of 9

c. 81 as a power of 3

$$3^3 = 27 \times$$

d. 0.25 as a power of 2



trial and error

$$2^{-2} = 0.25$$

note:
$$2^{-2}$$

= $\frac{1}{2^{2}}$
= $\frac{1}{4}$
= 0.25

Using a common base to solve exponential equations

- Step 1 find common base on both sides of equation.
- Step 2 set exponents equal to each other and solve.

Solve the following exponential equations

a.
$$3^x = 3^7$$

 $\chi = 7$

b.
$$2^{x} = 32$$
 write 32
 $2^{x} = 2^{5}$ power of 2^{5}
 $2^{5} = 32$
 $2^{5} = 32$

c.
$$7^{3x-4} = 49$$

 $7^{3x-4} = 7^{2}$ set exponents d. $9^{2x-1} = 27^{3x}$
 $3x-4 = 7^{2}$ set exponents d. $9^{2x-1} = 27^{3x}$
 $3x-4 = 7^{2}$ set exponents d. $9^{2x-1} = 27^{3x}$
 $3x-4 = 7^{2}$ set exponents d. $9^{2x-1} = 27^{3x}$
 $3x-4 = 7^{2}$ solve $3x-1 = 1$
 $3x-1 =$