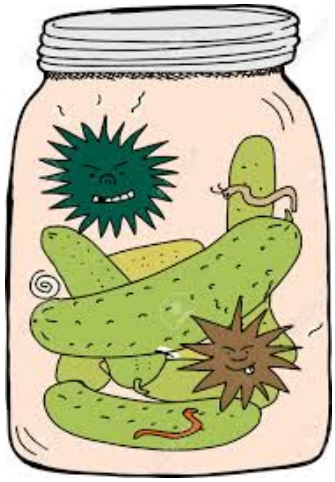
HAT
Solving (Easy) Exponential Equations

11/16/17

A scientist has a jar of bacteria which double every minute. After one hour, she sees that the jar is full of bacteria. After how many minutes was the jar half full?



Warm Up: Solve $2^x = 8^3$

Don't worry about a clever method (yet)... just get the answer!

2
4 256
8 512
16
32 (9)
64
128

512

$2^9 = 512$

$2^x = (2^3)^3$

$2^x = 2^9$

Ex#1: Solve $16^{2x-1} = 4^{6x}$

$(4^2)^{2x-1} = 4^{6x}$

$4x - 2 = 6x$

$-4x \quad -4x$

$-2 = 2x$

$-1 = x$

Ex#2: Solve $5^{3-2x} > \frac{1}{625}$

$5^{3-2x} > 5^{-4}$

$3-2x > -4$

$-3 \quad -3$

$-2x > -7$

$-2 \quad -2$

$x < \frac{7}{2}$

Ex#3: Compound Interest Formula $A = P\left(1 + \frac{r}{n}\right)^{n \cdot t}$

An investment account pays 5.4% annual interest compounded quarterly. If $4000 is placed in this account, find the balance after 8 years.

A = account balance

P = principal

r = interest rate (decimal)

n = # of times compounded per yr.

t = time (years)

$A = 4000\left(1 + \frac{.054}{4}\right)^{4 \cdot 8}$

$A = \$6143.56$

Ex#4: Solve $16^{18}+16^{18}+16^{18}+16^{18}=2^{x}$

$2^{2015}-2^{2014}=?$

Assignment:

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