The half-life of a certain medicine is 40 minutes. If a patient is given a 200mg dose at 9:00 am how many mg of the medicine is still in their system at 3:00pm?

You can now finish Hwk #24

Sec 8-1

Page 434

Problems 9, 20-23, 35-38, 45-48

The number of cells of a certain virus doubles every 45 minutes. If there are 120 cells at 11:30 pm how many cells will there be at 5:00 am the next day?

$$y = 120(2)$$

$$= 19,357 \text{ cells}$$

$$= 19,357 \text{ cells}$$

$$\frac{195}{7.333}$$

$$\frac{195}{7.333}$$

$$\frac{195}{7.333}$$

$$\frac{195}{7.333}$$

$$\frac{195}{7.333}$$

$$\frac{195}{7.333}$$

$$\frac{195}{7.333}$$

$$\frac{195}{7.333}$$

instead.

The value of an investment is increasing 8% each year.

If the investment's value today is \$125,000 find the number of years, to the nearest hundredth, it will take to reach \$1,000,000.

$$125,000(1.08)^{X} = 1,000,000$$

graphing both sides separately and finding the x-coordinate of the point of intersection leads to x = 27.02 yrs

## Find the value of x in each equation: Round to the nearest hundredth when needed.

1. 
$$\frac{12x}{12} = \frac{600}{12}$$

2. 
$$\sqrt[3]{64} = \sqrt[3]{x^3}$$
  $x = 4$ 

$$x = 4$$

3. 
$$10^5 = x$$

$$4. 10^{x} = 200$$

Inverse Operation
Subtraction
Multiplication
Square Root
Cubing

Every math operation has it's inverse.

Inverse operations "undo" each other.

We solve equations by using inverses to get the variable by itself.

Find the equation of the inverse for this function:

$$y = \sqrt{\frac{4x^3 - 7}{8}} + 1$$

switch x and y then solve for y.

$$\chi = \sqrt{\frac{4g^3 - 7}{8}} + 1$$

Find the equation of the inverse.

$$y = 10^{x}$$

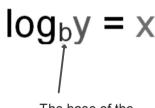
## Sec 8-3: Logarithms (the inverse of exponential functions)

Exponential Function

The base of the Exponential Function

The exponent

Logarithmic Function

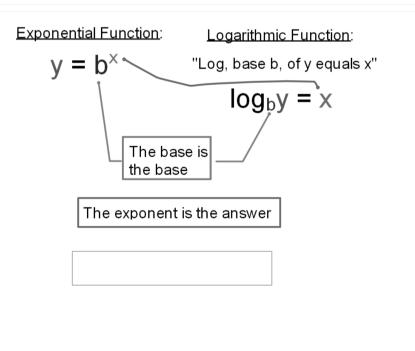


The base of the Logarithmic Function

To solve for x in an exponential equation:  $y = 10^x$  we use the inverse operation called:

## Logarithm

The abbreviation for Logarithm is: Log



Another way to remember Logarithmic Form:

Exponential Form:

$$x = y^z$$

becomes

Lograrithmic Form:

$$z = Log_y x$$

**Exponential Equation** 

Range:
$$y>0$$

$$y = b$$

$$b>0, b \neq 1$$
Any real number

Logarithmic Equation

$$log_b y = x$$

Range: Domain: x > 0 number

b: b>0, b**‡**1