

16-1

## Rewrite &amp; Solve Logs &amp; Exponentials

$$\log_y z = x \iff y^x = z$$

1) Base is the base

2) Log equals the exponent

$$\log_3 5 = x \Rightarrow 3^x = 5 \quad 7^9 = 32 \Rightarrow \log_7 32 = 9$$

Solving Logs: (Either it's something you should already know or you'll ask a calculator, Calculator stuff is day after tomorrow)

$$\log_3 9 = 2 \quad \log_2 32 = 5 \quad \log_7 1 = 0 \quad \log_{25} 5 = \frac{1}{2} \quad \begin{array}{l} \star \text{ Power of} \\ \frac{1}{5} = 5 \end{array}$$

$$\log_7 100 = 2 \quad ? 10 \quad \text{10 is also the default base} \quad \begin{array}{l} \text{Power of} \\ \frac{1}{3} = 3 \end{array}$$

## Solving Exponentials

$$3^{2x-5} = 3^{x+3}$$

$$2^{3x} = \frac{1}{8}$$

$$5(3)^x = 405$$

$$25^{2x+1} = \left(\frac{1}{125}\right)^{2x}$$

$$2x-5 = x+3$$

$$2^{3x} = 2^{-3}$$

$$3^x = 81$$

$$(5^2)^{2x+1} = (5^{-3})^{2x}$$

$$x-5 = 3$$

$$3x = -3$$

$$3^x = 3^4$$

$$4x+2 = -6x$$

$$\boxed{x = 8}$$

$$\boxed{x = -1}$$

$$\boxed{x = 4}$$

$$10x+2 = 0$$

$$10x = -2$$

$$\boxed{x = -\frac{1}{5}}$$

If you can't solve it as a log, convert it to an exponential.

If you can't solve it as an exponential, convert it to a log.

$$\log_4 8 = 2x$$

$$4^{2x} = 8$$

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

$$4x = 3$$

$$\boxed{x = \frac{3}{4}}$$

CW/HW - 9.1 practice WS