*Module 4 Lesson 6:*

*Exponential and Power Equations*

General Exponential Equation General Power Equation

 $y=ab^{x}$ $y=ax^{b}$

**Learning Targets:**

* **I can identify the base of an exponential and power equation.**
* **I can solve exponential equations by forming like bases.**
* **I can solve power equations using the idea of a reciprocal.**

**Solving Exponential Equations:**

$$125=5^{x+1}$$

 Step 1:

 Step 2:

 Step 3:

**Examples:**

1. $16^{-x}=4$ 3. $8^{x-1}=4^{x+1}$
2. $4^{2x+1}=64^{x}$ 4. $9^{3x+1}=27^{x+2}$

6. $125^{x}=\left(\frac{1}{25}\right)^{4-x}$ $7. 3^{x^{2}+3x}=81$

8. $2^{x^{2}-3}=64$ 9. $2\left(6^{2x-1}\right)-5=427$

**Solving Power Equations**

$$2x^{\frac{2}{3}}=18$$

 Step 1:

 Step 2:

 Step 3:

**Examples:**

1. $5+x^{\frac{3}{5}}=13$ 3. $4\sqrt[3]{x^{2}}=144$
2. $\left(3x\right)^{\frac{3}{2}}=27$ 4. $5x^{\frac{-3}{2}}-7=618$

5. $\left(x+2\right)^{^{3}/\_{4}}-1=7$ 6. $2\left(x+3\right)^{^{5}/\_{2}}-1=63$