1] If $7 = m^x$, then $7m^2 = ?$

Ans: Mult. both sides by $m^2 \Rightarrow 7m^2 = m^x \cdot m^2$

$$7m^2 = \underline{\underline{m^{(x+2)}}}$$

2] If $3^{7x+6} = 27^{3x}$, what is value of x?

Ans: $3^{7x+6} = (3^3)^{3x}$

$$3^{7x+6} = 3^{9x}$$

$$7x + 6 = 9x \Rightarrow \underline{\underline{x = 3}}$$

3] If $3^4 = x$, which of the following expressions is equal to 3^{10}?

Ans: $3^{10} = 3^2 * (3^4)^2 = \underline{\underline{9x^2}}$

4] $10^{xy} = 1000$, where x and y are positive integers and $x > y$, what is one possible value of x?

Ans: $10^{xy} = 10^3$

$xy = 3$ } Values are either 1 or 3

Since $x > y$ so,

$$\underline{\underline{x = 3}}$$

5] If x and y are positive integers and $9(3^x) = 3^y$, what is x in terms of y?

Ans: $9(3^x) = 3^y$

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

$$3^{2+x} = 3^y$$

$$2 + x = y \rightarrow \underline{\underline{x = y - 2}}$$

6] If x is a positive integer and $3^{2x} + 3^{(2x+1)} = y$, what is $3^{(2x+2)}$ in terms of y?

Ans: $3^{2x} + 3^{(2x+1)} = y$

$$3^{2x} + 3^{2x} \cdot 3 = y$$

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

$$3^{2x} \cdot 2^2 = y$$

$$3^{2x} = \frac{y}{4}$$

$$3^{2x} \cdot 3^2 = \frac{y}{4} \cdot 3^2$$

$$3^{2x+2} = \frac{9y}{4}$$