MTH-PT Trigonometry Session 1 1/26

Exponents

exponent/power

$2^3 = 2 \cdot 2 \cdot 2 = 8$

base

$5^{-2} = \frac{1}{5 \cdot 5} = \frac{1}{5^2}$

$5^4 = \frac{5 \cdot 5 \cdot 5 \cdot 5}{5^6 = 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5} = \frac{1}{5^2}$

exponent

$8^{\frac{2}{3}} = \sqrt[3]{8^2} = \left(\sqrt[3]{8}\right)^2$

root

$\frac{5^4}{5^6} = 5^{4-6} = 5^{-2} = \frac{1}{5^2}$

$(2)^2 = \boxed{4}$

$(4)^3 = (2^2)^3 = 2^2 \cdot 2^2 \cdot 2^2 = 2^6$

$2^2 \cdot 2^2 \cdot 2^2 = 2^{2+2+2} = 2^6$

change the base

$(2^2)^3 = 2^{2 \cdot 3} = 2^6 \quad 4^3 = 2^6$

$x^3 * x^7 = x^{3+7} = \boxed{x^{10}}$

$\frac{x^8}{x^3} = x^{8-3} = \boxed{x^5}$

$3^0 = 1$

$\frac{3^4}{3^4} = 3^{4-4} = 3^0$

$3^0 = 1$

$\frac{3 \cdot 3 \cdot 3 \cdot 3}{3 \cdot 3 \cdot 3 \cdot 3} = \frac{1}{1} = 1$

$1{,}027^{\circ} = 1$ $\quad 3{,}824^{\circ} = 1$  $= 1$

$0^{\circ} \neq 1$

$8 = 2^3$

$$\frac{8^4}{2^7} = \frac{(2^3)^4}{2^7} = \frac{2^{3\cdot 4}}{2^7} = \frac{2^{12}}{2^7} = 2^{12-7} = \boxed{2^5}$$

exponent ↓ $2/3$ ↑ root

1.) $125^{2/3} = \left(\sqrt[3]{125}\right)^2$

$(5)^2 = \boxed{25}$

2.) $6^{-3} = \boxed{\frac{1}{6^3}}$

3.) $27^4 * 9^5$

$\downarrow \qquad \downarrow$

$\left(3^3\right)^4 * \left(3^2\right)^5$

$3^{12} * 3^{10} = 3^{12+10}$

$\boxed{3^{22}}$

4.) $\frac{64^2}{2^5} = \frac{(2^6)^2}{2^5} = \frac{2^{12}}{2^5}$

$2^{12-5} = \boxed{2^7}$

$4^{a} = 2^{6}$

$\downarrow$

$(2^{2})^{a} = 2^{6} = \underline{\underline{2^{2a}}} = \underline{\underline{2^{6}}}$

$\frac{2a}{2} = \frac{6}{2}$

$\boxed{a = 3}$

$64^{2-3n} = \frac{1}{16}$

$\downarrow$

$(4^{3})^{2-3n} = 4^{-2}$

$4^{3(2-3n)} = 4^{-2}$

$4^{6-9n} = 4^{-2}$

$6 - 9n = -2$

$-6 \qquad -6$

$-9n = -8$

$\frac{-9n}{-9} = \frac{-8}{-9}$

$\boxed{n = \frac{8}{9}}$

$25^{3m+1} = 125^{2m+2}$

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

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

$\cancel{5}^{6m+2} = \cancel{5}^{6m+6}$

$5^{6m+2} = 5^{6m+6}$

$6m+2 = 6m+6$

$-6m \quad -6m$

$2 = 6$

no solution

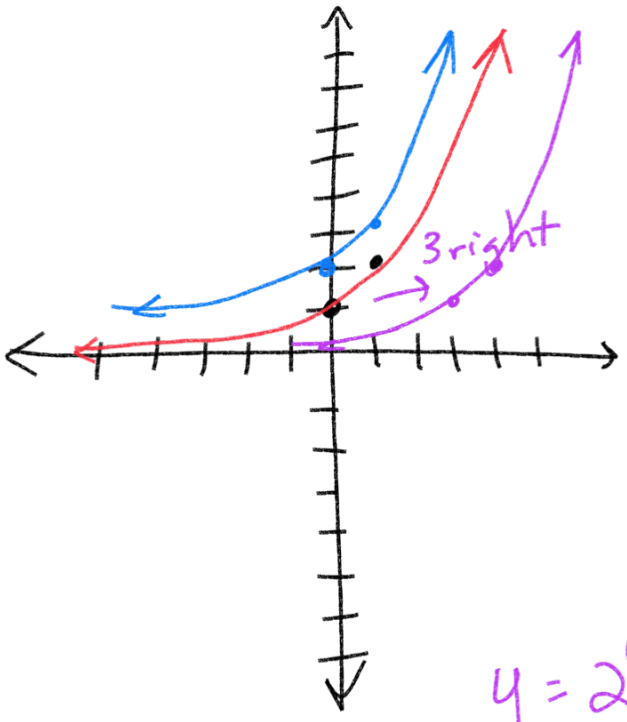
Graphing Exponents

$y = 2^x$

$x=0 \quad x=1$

$2^0 = 1 \quad 2^1 = 2$

$(0,1) \quad (1,2)$



$y = 2^{x+1}$

$x=0 \quad x=1$

$2^0+1 \quad 2^1+1$

$1+1 \quad 2+1$

$(0,2) \quad (1,3)$

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

$x-3=0 \quad x-3=1$

$x=3 \quad x=4$

$y=1 \quad y=2$