

Trig WS2

Homework Questions

$$6. \quad 2\sin x - \sqrt{2} = 0 \quad \left(0, \frac{\pi}{2}\right)$$

$$2\sin x = \sqrt{2}$$

$$\sin x = \frac{\sqrt{2}}{2}$$

$$x = 45^\circ, \pi/4$$

$$360 = 2\pi$$

$$180 = \pi$$

$$\text{degree} \left(\frac{\pi}{180} \right) = \text{radian}$$

$$\text{radian} \left(\frac{180}{\pi} \right) = \text{degree}$$

$$\frac{\pi}{3} = 60^\circ \quad \frac{\pi}{6} = 30^\circ$$

$$\frac{\pi}{2} = 90^\circ \quad \frac{\pi}{4} = 45^\circ$$

$$10. \quad 2\cos\theta - 1 = 0 \quad (180^\circ, 360^\circ)$$

$$\cos\theta = \frac{1}{2}$$

$$\theta = 300^\circ \text{ or } \frac{5\pi}{3}$$

$$(\pi, 2\pi)$$

Exponent Laws

$$(X^b)(X^c) = X^{b+c}$$

$$(X^b)^c = X^{bc}$$

$$X^{-b} = \frac{1}{X^b}$$

$$\frac{1}{a^{-b}} = a^b$$

$$\frac{a^c}{a^b} = a^{c-b}$$

$$X^{1/b} = \sqrt[b]{X}$$

$$X^{1/2} = \sqrt{X}$$

$$X^{1/3} = \sqrt[3]{X}$$

power \rightarrow root

$$X^{c/b} = (\sqrt[b]{X})^c$$

$$X^0 = 1$$

$$\rightarrow \frac{X^2}{X^2} = \underline{1} = X^{2-2} = \underline{X^0} = X^0$$

$$(xy)^b = X^b y^b$$

$$(X+y)^b = (x+y)(x+y)(x+y)\dots$$

b # of times

$$\left(\frac{3x}{y^3}\right)^2 = \frac{9x^2}{y^6}$$

$$(x^2y^{-5})(2x^{-4}y^4) = 2x^{-2}y^{-1}$$

$$\cancel{\frac{2}{x^4y}}$$

$$\boxed{\frac{2}{x^2y}}$$

$$\left(\frac{m^2}{n}\right)^{-2} \left(\frac{m^0}{n^{-1}}\right)^3$$

$$\frac{m^{-4}}{n^{-2}} \cdot \frac{m^0}{n^{-3}}$$

$$\frac{n^2}{m^4} \cdot \frac{n^3}{1} = \frac{n^5}{m^4}$$

$$\left(\frac{c^2}{d}\right)^{-3} (2c^{-1}d)^{-3}$$

$$\frac{c^{-6}}{d^3} \cdot \frac{2c^{-3}d^{-3}}{1}$$

$$\frac{d^3}{c^6} \cdot \frac{c^3}{d^3 \cdot 2^3}$$

$$\frac{d^3c^3}{8c^6d^3} = \boxed{\frac{1}{8c^3}}$$

$$\frac{x^2}{x^{3/2}} = x^{2-1.5} = x^{0.5} = \sqrt{x}$$

$$\left(\frac{9x^{-2}}{12y}\right)^{-1/2} = \left(\frac{12y}{9x^{-2}}\right)^{1/2} = \frac{\sqrt{12y}}{\sqrt{9x^{-2}}}$$

$$= \frac{\sqrt{12yx^2}}{\sqrt{9}} = \frac{2\sqrt{3yx^2}}{3} = \boxed{\frac{2x\sqrt{3y}}{3}}$$

Logarithms

$$\text{if } a^y = x \quad \text{then} \quad \log_a x = y$$

logs are useful because you can expand and contract them

$$\log ab = \log a + \log b$$

$$\log \frac{a}{b} = \log a - \log b$$

$$\log a^n = n \times \log a$$

$$\log \left(\frac{x^2 y}{4} \right) = \log x^2 y - \log 4$$

$$\log x^2 + \log y - \log 4$$

$$\boxed{2 \log x + \log y - \log 4}$$

$$4 \ln x + 2 \ln y - \ln x - \ln 4$$

$$\ln x^4 + \ln y^2 - \ln x - \ln 4$$

$$\ln x^4 y^2 - \ln x - \ln 4$$

$$\ln \left(\frac{x^4 y^2}{4x} \right) = \ln \left(\frac{x^3 y^2}{4} \right)$$