

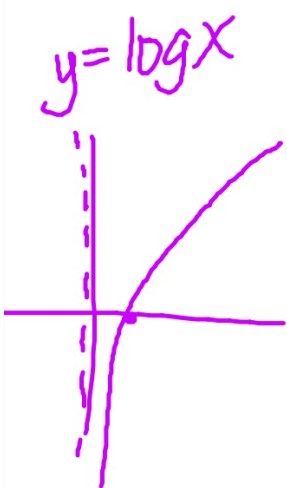
12.) $\log_6(x+5) + \log_6 x = 2$

$$\log_6(x^2+5x) = 2$$

$$6^2 = x^2 + 5x$$

$$0 = x^2 + 5x - 36$$
$$(x+9)(x-4)$$

~~9, 4~~



$$18.) (x-4)^{2/3^{3/2}} = (16)^{3/2}$$

$$x-4 = \pm 64$$

$$16^{3/2} = (4^2)^{3/2}$$

64

$$(x^2)^{1/2} = (16)^{1/2}$$

$$x = \pm 4$$

$$x = 4 \pm 64$$

$$4 - 64$$

$$4 + 64$$

$\{-60, 68\}$

$$27.) (x+5)^{-1/2} - (x+5)^{-3/2}$$

$$(x+5)^{-3/2} \left((x+5)^1 - 1 \right) = (x+5)^{-3/2} (x+4)$$

$$\frac{-1}{2} - \frac{-3}{2}$$

1

$$\begin{array}{l} x^7 - x^5 \\ x^5(x^2 - 1) \end{array}$$

$$21.) \frac{3x}{x^2+2x} - \frac{1}{2x}$$

$$\frac{3x \cdot 2}{x(x+2)} - \frac{1(x+2)}{2x}$$

$$\frac{6x - (x+2)}{2x(x+2)}$$

$$\frac{5x-2}{2x(x+2)}$$

$$13.) \overset{q}{x^3} - 10x - \overset{p}{12} = 0$$

$$\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12 = \frac{p}{q}$$

$$\begin{array}{r|rrrr} -2 & 1 & 0 & -10 & -12 \\ & & -2 & 4 & 12 \\ \hline & 1 & -2 & -6 & 0 \end{array}$$

$$(x+2)(x^2-2x-6) = 0$$

$$\left\{ -2, \frac{2 \pm \sqrt{4 - 4(1)(-6)}}{2} \right\}$$

$$\left\{ -2, \frac{2 \pm 2\sqrt{7}}{2} \right\}$$

$$\left\{ -2, 1 \pm \sqrt{7} \right\}$$

$$11.) 2x^3 - 3x^2 - 11x + 6 = 0$$

$$p: \pm 1, \pm 2, \pm 3, \pm 6$$

$$q: \pm 1, \pm 2$$

$$\frac{p}{q}: \pm 1, \pm \frac{1}{2}, \pm 2, \pm 3, \pm \frac{3}{2}, \pm 6$$

$$28.) f(x) = x^5 + x^3 - x$$

$$f(3) = 3^5 + 3^3 - 3 = 267$$

$$f(-3) = (-3)^5 + (-3)^3 - (-3) = -267$$

$$f(-x) = -x^5 - x^3 + x$$

$$22.) \frac{x^3 - x - 1}{x + 2} = x^2 - 2x + 3 - \frac{7}{x + 2}$$

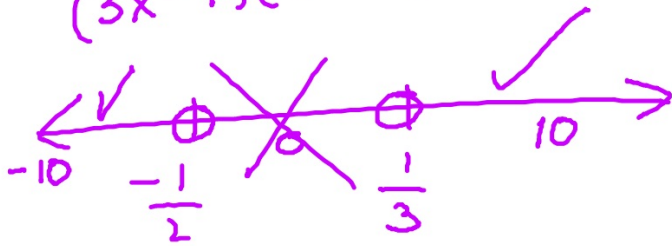
$$\begin{array}{r|rrrr} -2 & 1 & 0 & -1 & -1 \\ & & -2 & 4 & -6 \\ \hline & 1 & -2 & 3 & -7 \end{array}$$

$$\begin{array}{r} x^2 - 2x + 3 \\ x+2 \overline{) x^3 + 0x^2 - x - 1} \\ \underline{-x^3 + 2x^2} \\ -2x^2 - x \\ \underline{+2x^2 + 4x} \\ 3x - 1 \\ \underline{-3x + 6} \\ -7 \end{array}$$

$$20.) 6x^2 + x > 1$$

$$\rightarrow 6x^2 + x - 1 > 0$$

$$(3x-1)(2x+1) > 0$$



$$42.) \ln \sqrt[5]{e^3 x^2 y^4}$$

$$\frac{1}{5} [\ln e^3 + \ln x^2 + \ln y^4]$$

$$\frac{1}{5} (3 \ln e + 2 \ln x + 4 \ln y)$$

$$\frac{3}{5} + \frac{2}{5} \ln x + \frac{4}{5} \ln y$$

$$\ln e = 1$$

$$\ln 1 = 0$$

$$53.) 2\sin^2 x - \sin x - 1 = 0$$

$$(2\sin x + 1)(\sin x - 1) = 0$$

$$\sin x = -\frac{1}{2}$$

$$x = \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{\pi}{2}$$

$$\sin x = 1$$

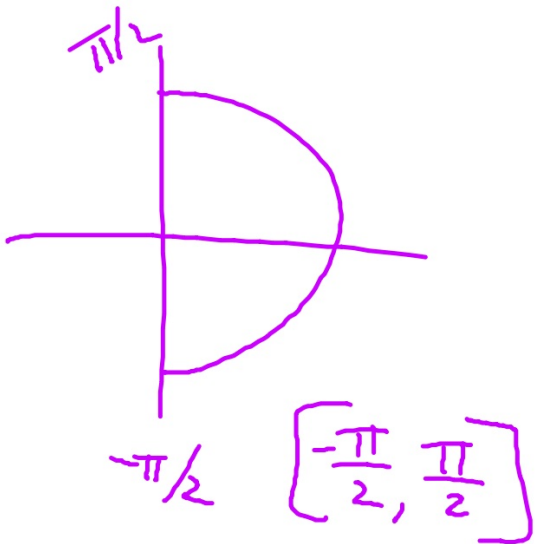


$$[0, 2\pi)$$

$$2x^2 - x - 1 = 0$$
$$(2x + 1)(x - 1) = 0$$

$$\sin \frac{\pi}{6} = \frac{1}{2}$$

$$50.) \sin^{-1}\left(-\frac{\sqrt{3}}{2}\right) = -\frac{\pi}{3}$$



$$\frac{5\pi}{3} \quad \times$$

$$54.) \sin^2 x + \cos x + 1 = 0$$

$$(1 - \cos^2 x) + \cos x + 1 = 0$$

$$-\cos^2 x + \cos x + 2 = 0$$

$$-1(\cos^2 x - \cos x - 2) = 0$$

$$-1(\cos x - 2)(\cos x + 1) = 0$$

$$\cos x = 2$$

X

$$\cos x = -1$$

$$x = \pi$$

$$57.) \frac{\cancel{\tan\theta} \cancel{\sin\theta} \cos\theta}{\sin\theta \sec\theta}$$

$$\frac{\frac{\cancel{\sin\theta}}{\cancel{\cos\theta}} \cdot \cancel{\cos\theta}}{\sin\theta \cdot \frac{1}{\cancel{\cos\theta}}}$$

$$\frac{\cancel{\sin\theta}}{\frac{\cancel{\sin\theta}}{\cancel{\cos\theta}}} = \cancel{\sin\theta} \cdot \frac{\cancel{\cos\theta}}{\cancel{\sin\theta}} = \cos\theta$$