$y = \dfrac{x+1}{x-6}$

$\dfrac{x+1}{y-\cancel{6}} \cancel{x-6}$

$= y+1$

$x = y+1$

$= 6x+1$

$y = \boxed{\dfrac{6x+1}{x-1}}$

8 a) $x^2 - 5 \neq 0$

$x^2 \neq 5$

$x \neq \pm\sqrt{5}$

$-\infty \quad -\sqrt{5} \quad \sqrt{5} \quad \infty$

$D: (-\infty, -\sqrt{5}) \cup (-\sqrt{5}, \sqrt{5}) \cup (\sqrt{5}, \infty)$

b) $x+2 > 0$

$x > -2$

-2

$D: (-2, \infty)$

c) $9 - x^2 > 0$

$- \quad + \quad -$

$-\infty \quad -3 \quad 3 \quad \infty$

$D: (-3, 3)$

d) $2x - 4 \geq 0$

$2x \geq 4$

$x \geq 2$

2

$D: [2, \infty)$

) Pos: $2x^3 - 4x^2 + 2x + 7$

$\boxed{2 \text{ or } 0}$ $+ \quad - \quad + \quad +$

Neg: $-2x^3 - 4x^2 - 2x + 7$

$\boxed{1}$ $- \quad - \quad - \quad +$

10

d) $f(x-1) - f(x)$

$(x-1)^2 + 7(x-1) + 12 - (x^2 +$

$\cancel{x^2} - 2x + 1 + \cancel{7x} - 7 + \cancel{12} - \cancel{x^2} - \cancel{7}$

$\boxed{-2x-6}$

e) $\dfrac{(x+h)^2 + 7(x+h) + 12 - (x^2 + 7x + 12)}{h}$

$\dfrac{\cancel{x^2} + 2xh + h^2 + \cancel{7x} + 7h + \cancel{12} - \cancel{x^2} - \cancel{7x} - \cancel{12}}{h} = \dfrac{2xh + h^2 +}{h}$

$\boxed{2x + h +}$

$y = 26.1^{5x}$

$\log_{26.1} y = 5x$

$\dfrac{\log_{26.1} y}{5} = x$

a) $= 500 \times 12 \times 10 =$

b) $F_{120} = 500\left[\dfrac{\left(1+\frac{.042}{12}\right)^{120}-1}{\left(\frac{.042}{12}\right)}\right]$

(21) $P_n = P\left(\dfrac{1-(1+i)^{-n}}{i}\right)$

$200{,}000 = P\left(\dfrac{1-\left(1+\frac{.08}{12}\right)^{-3}}{\left(\frac{.08}{12}\right)}\right)$

(20) $A = P\left(1+\frac{r}{n}\right)^{nt}$

$3000 = 1000\left(1+\dfrac{.035}{4}\right)^{4t}$

$3 = \left(1+\frac{.035}{4}\right)^{4t}$

$\log_{1+\frac{.035}{4}} 3 = 4t$

) $\log_x x^{1/7}$

$\frac{1}{7} \cdot \log_x x$

$\frac{1}{7}(1) = \frac{1}{7}$

(28) a) $80^{x-4} = 17^{6x}$

$\cancel{\log_{80} 80}^{x-4} = \log_{80} 17^{6x}$

$(x-4) \cdot 1 = 6x \cdot \log_{80} 17$

$x-4 = 6x \cdot \log_{80} 17$

$-4 = 6x \cdot \log_{80} 17 - x$

$-4 = x(6\log_{80} 17 - 1)$

$$\frac{-4}{(6 \cdot \log_{80} 17 - 1)} = x$$

$$15^{x+5} = 8^{x-1}$$

$$\cancel{\log_{15} 15}^{x+5} = \log_{15} 8^{x-1}$$

$$x+5 = (x-1)\log_{15} 8$$

$$x+5 = x \cdot \log_{15} 8 - \log_{15} 8$$

$$x - x\log_{15} 8 = -5 - \log_{15} 8$$

$$x(1 - \log_{15} 8) = -5 - \log_{15} 8$$

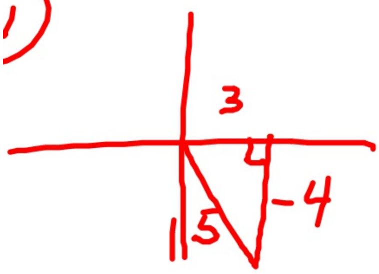
$$x = \frac{(-5 - \log_{15} 8)}{(1 - \log_{15} 8)}$$

30 $a^2 = b^2 + c^2 - 2bc\cos A$

b/c - Must solve for biggest ∡ 1st.

Then use LOS to get

1)



$2\theta = 2\cdot \sin\theta \cos\theta$

$2\cdot \frac{-4}{5}\cdot\frac{3}{5} = \frac{-24}{25}$

$\theta = \cos^2\theta - \sin^2\theta$

$\left(\frac{3}{5}\right)^2 - \left(\frac{-4}{5}\right)^2$

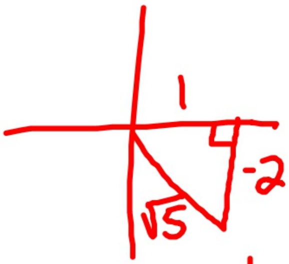
$\frac{9}{25} - \frac{16}{25} = \frac{-7}{25}$

$\tan 2\theta = \frac{2\tan\theta}{1-\tan^2\theta}$

$= \frac{2\cdot\frac{-4}{3}}{1-\left(\frac{-4}{3}\right)^2} = \frac{\frac{-8}{3}}{\frac{-7}{9}} = \frac{-8}{3}\cdot$

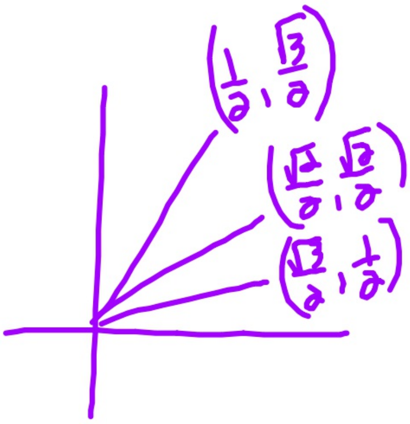
$1-\frac{16}{9}$

$= \boxed{\frac{24}{7}}$



$$1+4=r^2$$
$$r=\sqrt{5}$$

$$\cos\theta = \frac{1}{\sqrt{5}} = \frac{\sqrt{5}}{5}$$



36 $\cos 75^\circ = \cos(30^\circ + 45^\circ)$

$$\cos 30^\circ \cos 45^\circ - \sin 30^\circ \sin 45^\circ$$

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

$$\boxed{\frac{\sqrt{6}-\sqrt{2}}{4}}$$

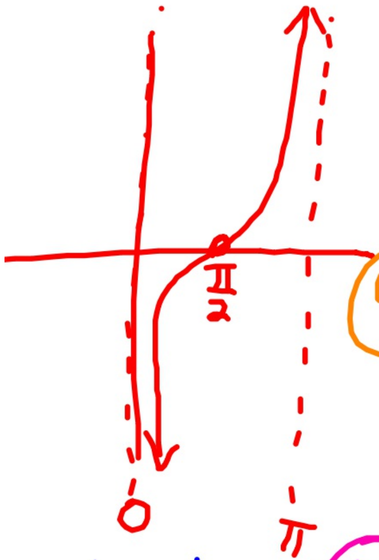
b) $\tan 105^\circ = \tan(60^\circ + 45^\circ)$

$$\frac{\tan 60^\circ + \tan 45^\circ}{1 - \tan 60^\circ \tan 45^\circ}$$

$$\frac{(\sqrt{3} + 1)(1+\sqrt{3})}{(1-\sqrt{3})(1+\sqrt{3})}$$

$$\frac{1+2\sqrt{3}+3}{1-3} = \frac{4+2\sqrt{3}}{-2}$$

$$= \boxed{-2-\sqrt{3}}$$

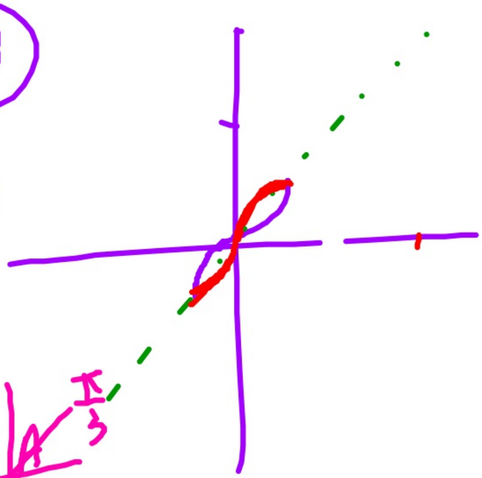


39 $y = 2\sin\left(3\left(\theta + \frac{\pi}{3}\right)\right) - 3$

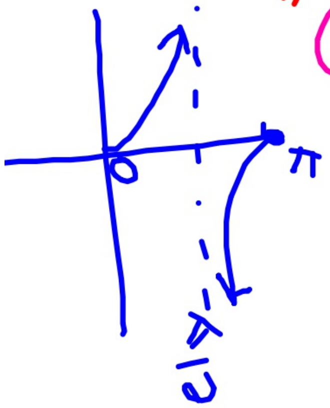
$y = 2\sin(3\theta + \pi) - 3$

41 $y = 3\cos\frac{1}{2}\left(\theta - \frac{\pi}{2}\right)$ $\frac{2\pi}{x} = \frac{2\pi}{3}$

43



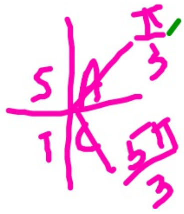
45 b) $\cos^{-1}\left(\frac{1}{2}\right)$



$\sec\theta = 2$

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

$\theta = \frac{\pi}{3}$



$$\frac{\sin^2\theta}{1+\cos\theta} = \frac{1-\cos^2\theta}{1+\cos\theta} = \frac{\cancel{(1+\cos\theta)}(1-\cos\theta)}{\cancel{1+\cos\theta}} = \boxed{1-\cos\theta}$$

$\tan^2\theta - \tan^2\theta\sin^2\theta$

$\tan^2\theta(1-\sin^2\theta)$

$\tan^2\theta\cos^2\theta$

$\frac{\sin^2\theta}{\cancel{\cos^2\theta}}\cancel{\cos^2\theta}$

$\boxed{\sin^2\theta}$

$\cot^2\theta - \csc^2\theta$

$\cancel{\csc^2}\theta - 1 - \cancel{\csc^2}\theta$

$\boxed{-1}$

c) $\frac{1}{1+\cos\theta}\cdot\frac{1-\cos\theta}{} + \frac{1}{1-\cos\theta}\cdot\frac{1+\cos\theta}{}$

$\frac{1-\cancel{\cos\theta}+1+\cancel{\cos\theta}}{(1-\cos^2\theta)}$

$\frac{2}{\sin^2\theta}$

$\boxed{2\csc^2\theta}$

e) $\frac{\sin^2\theta\cot\theta\csc}{\sec\theta}$

$\frac{\cancel{\sin^2\theta}\cdot\frac{\cos\theta}{\cancel{\sin\theta}}\cdot}{\frac{1}{\cos\theta}}$

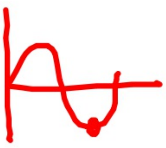
$\cos\theta\cdot\cos\theta$

$\boxed{\cos^2\theta}$

$\sin^2\theta + 2\sin\theta + 1 = 0$

$(\sin\theta + 1)(\sin\theta + 1) = 0$

$\sin\theta = -1$



$\theta = 3\pi/2$

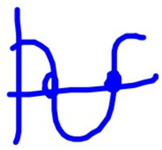
$$\boxed{\theta = \frac{3\pi}{2} \pm 2\pi K}$$

48 a) $\sin 2\theta = -\cos\theta$

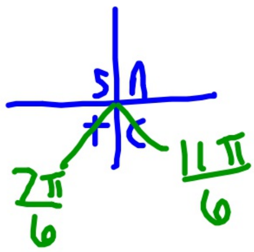
$2\sin\theta\cos\theta + \cos\theta = 0$

$\cos\theta(2\sin\theta + 1) = 0$

$\cos\theta = 0 \qquad \sin\theta = -1/2$



$\theta = \frac{\pi}{2}, \frac{3\pi}{2}$



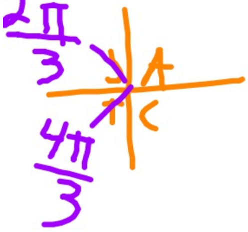
$\cos 2\theta - \cos\theta = 0$

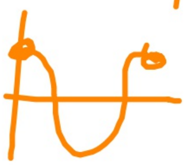
$2\cos^2\theta - 1 - \cos\theta = 0$

$2\cos^2\theta - \cos\theta - 1 = 0$

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

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





$\theta = 0, 2\pi$

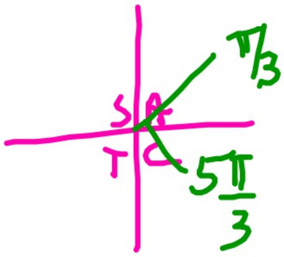
49a

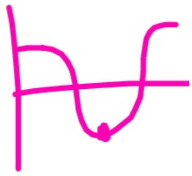
$\sec^2\theta - \sec\theta - 2 = 0$

$(\sec\theta - 2)(\sec\theta + 1) = 0$

$\sec\theta = 2$ $\quad$ $\sec\theta = -1$

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





$\theta = \pi$

$$\frac{1+\tan x}{1-\tan x} = \tan\left(\frac{\pi}{4}+x\right)$$

$$= \frac{\tan\frac{\pi}{4}+\tan x}{1-\tan\frac{\pi}{4}\cdot\tan x}$$

$$= \frac{1+\tan x}{1-\tan x}$$

54) $\begin{array}{cc} h & k \\ (5, & -2) \end{array}$ $\begin{array}{cc} x & y \\ (0, & 1) \end{array}$

$(x-h)^2+(y-k)^2=r^2$

$(0-5)^2+(1+2)^2=r^2$

$25+9=r^2$

$34=r^2$

$(x-5)^2+(y+2)^2=$

$$) \sin\left(x+\frac{\pi}{4}\right)+\sin\left(x-\frac{\pi}{4}\right)=-1$$

$$x\cos\frac{\pi}{4}+\cancel{\cos x\sin\frac{\pi}{4}}+\sin x\cos\frac{\pi}{4}-\cancel{\cos x\sin\frac{\pi}{4}}=-1$$

$$\sin(x)\cos \pi/4=-1$$

$$.\sin(x)\frac{\sqrt{2}}{\cancel{2}}=-1$$

$$\cdot\sin(x)=-1$$

$$\sin(x)=\frac{-1}{\sqrt{2}}=\frac{-\sqrt{2}}{2}$$

$$\frac{5\pi}{4},\ \frac{7\pi}{4}$$

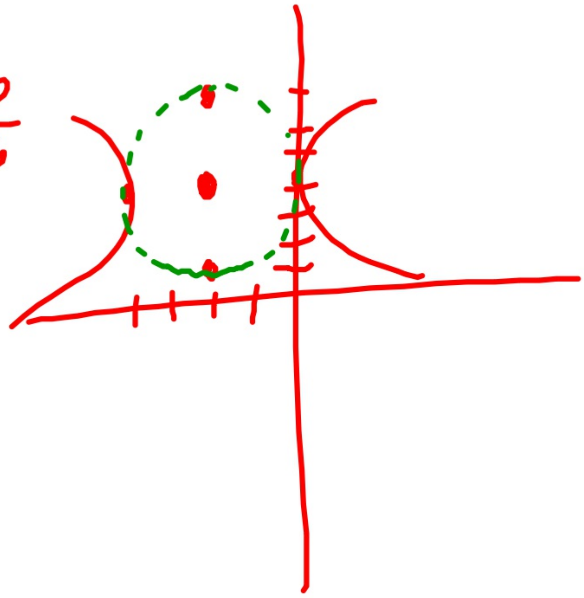
)

$$9x^2+36x \quad -4y^2+32y \quad =64$$

$$9(x^2+4x+4)-4(y^2-8y+16)=64+36-64$$

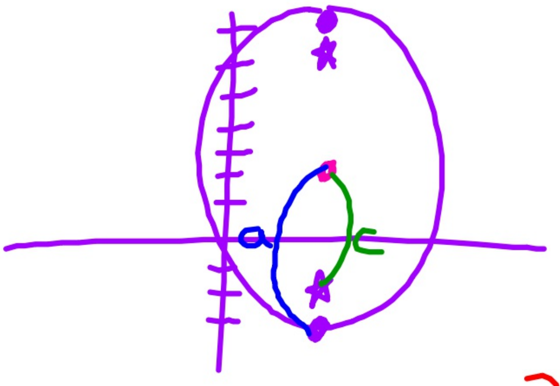
$$\frac{9(x+2)^2}{36}-\frac{4(y-4)^2}{36}=\frac{36}{36}$$

$$\frac{(x+2)^2}{4}-\frac{(y-4)^2}{9}=1$$



$C(-2,4)$

7



$(1, 2)$

$$\frac{(x-1)^2}{9} + \frac{(y-2)^2}{25} = 1$$

$a^2 = b^2 + c^2$

$5^2 = b^2 + 4^2$

$b^2 = 9$

$b = 3$

$x^2+y^2=r^2$

$2^2+2^2=r^2$

$8=r^2$

$r=2\sqrt{2}$

$\tan\theta=\frac{y}{x}$

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

$\theta=\tan^{-1}(1)$

$\theta=\pi/4$

60a $(6, 2\pi/3)$

$x=r\cdot\cos\theta$

$x=6\cdot\cos 2\pi/3$

$x=6\cdot -1/2$

$x=-3$

$y=r\cdot s$

$y=6\cdot s$

$y=6\cdot$

$y=3$

)

$x^2+y^2=20$

$r^2=20$

$r=\pm 2\sqrt{5}$

$x^2+y^2-3x=0$

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

$r^2=3r\cos\theta$

$\boxed{r=3\cos\theta}$

62a

$r=4$

$r^2=16$

$x^2+y^2=16$

62b

$r\sin\theta=5$

$y=5$

$x = t + 5$ | $y = -3t$

$x - 5 = t$

$y = -3(x-5)$

$y = -3x + 15$

64a $3x - 2y = 6$

$x = t$

$3t - 2y = 6$

$-2y = -3t + 6$

$y = \frac{3}{2}t - 3$

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

$$y = \frac{\cancel{x}(2x^2 - 1)}{\cancel{x}(x-2)}$$

$(0, \frac{1}{2})$

$=2$

ne

$=2x+4$

$$\begin{array}{r|rrr} 2 & 2 & 0 & -1 \\ & & 4 & 8 \\ \hline & 2 & 4 & \boxed{7} \end{array}$$

69a

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

$$y = \frac{1}{x^2 - x - 6}$$

$$\cos^2\left(\frac{3\pi}{4}\right) \neq \cos\left(\frac{3\pi}{4}\right)^2$$

$$\left(\cos\left(\frac{3\pi}{4}\right)\right)^2$$