

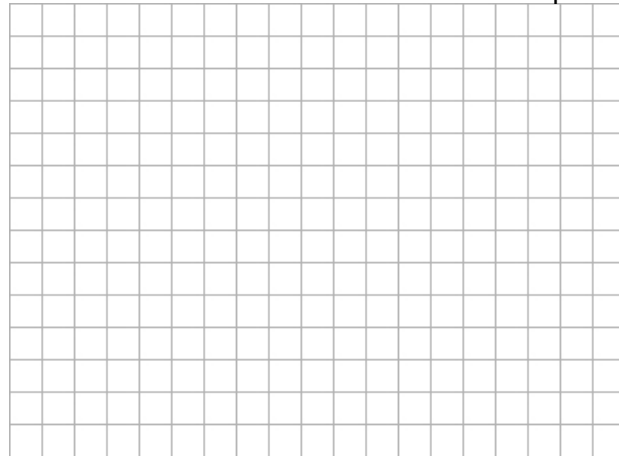
YOU MUST SHOW ALL OF YOUR WORK to receive full credit for the problem. The more work you show on your paper leading to your solution will give me more opportunity to award partial credit. Clearly indicate your solution to the problem.

1) Prove the identity $1 - \frac{\cot^2 \theta}{\csc^2 \theta} = \sin^2 \theta$

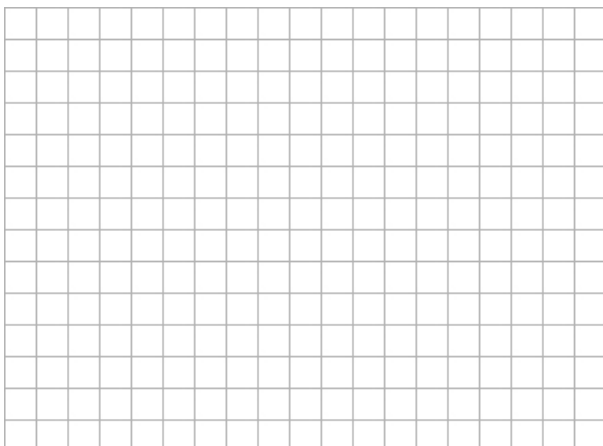
2) (a) Graph $y = \sin x$



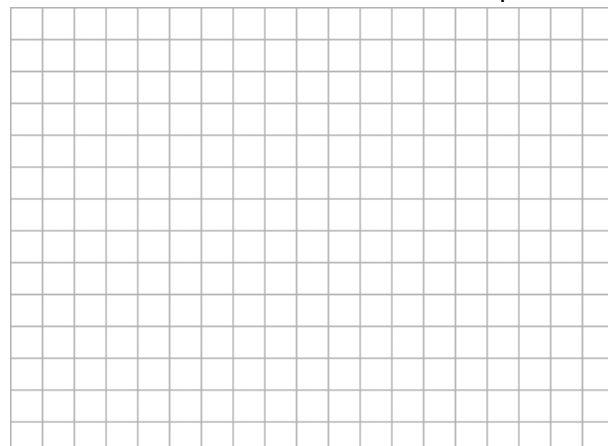
(b) Using part (a) graph $f(x) = -2 \sin(x - \frac{\pi}{4})$



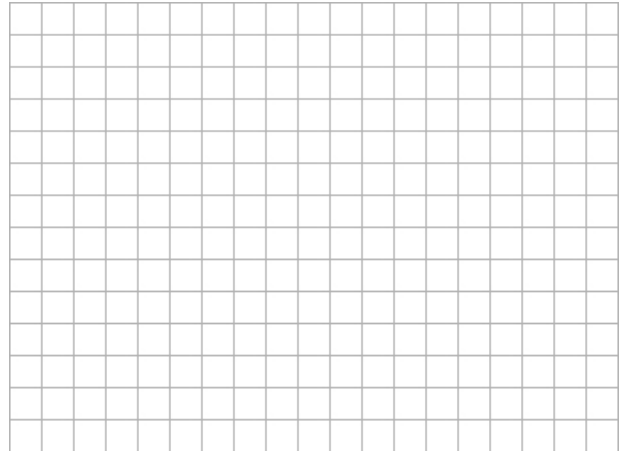
3) (a) Graph $y = \tan x$



(b) Using part (a) graph $g(x) = \tan(x + \frac{\pi}{4}) + 2$



4) Graph $y = \cos^{-1} x - 3$



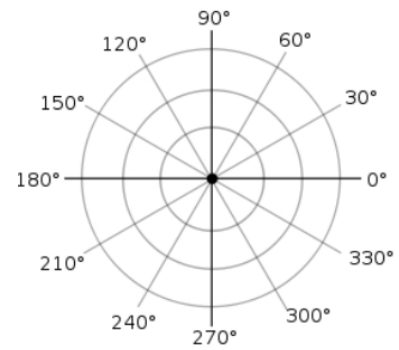
5) Find all solutions of $\sin x = \frac{1}{2}$ in interval $[0, 2\pi)$

6) Find all the solutions of $\sin 2x = 1$ in interval $[0, 2\pi)$

7) The position of a point $P(x,y)$ at time t is given by parametric equations $x = 1 + 2t$ and $y = 2 + 4t$ ($t \geq 0$). Find an x-y equation for the path traced out by the point P.

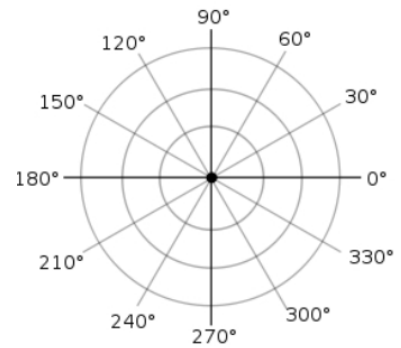
8) Plot the following points in a polar coordinate system .

(a) $(2.5, -\frac{\pi}{6})$, (b) $(-1, -\frac{\pi}{4})$



9) Graph the following equations in a polar coordinate system.

(a) $\theta = \frac{\pi}{6}$, (b) $r = 1.5$



10) Convert to rectangular form. $r = 2 \cos \theta$

11) Convert to polar form. $x^2 + y^2 = 25$

12) Find the distance between the points with polar coordinates $(4, \pi)$ and $(2, \frac{\pi}{2})$.