Math 104 Practice Final

1. Does the equation define y as a function of x? $y^2 = x + 2$

2. Find the domain of $f(x) = \frac{5}{3x+1}$.

3. Determine whether $f(x) = \frac{2}{x^2+5}$ is even, odd or neither.

4. Graph: $f(x) = (x+2)^2 + 3$

5. Find the arc length of a circle of radius 4 cm subtended by a 135° angle.

6. The minute hand of a clock is 5 inches long. How far does the tip of the minute hand move in 25 minutes?

7. Find the exact value: $3\tan\frac{\pi}{4} + \sin\frac{\pi}{6}$

8. Find the exact values of all the trigonometric functions of $7\pi/6$.

9. Find the exact value: $\sec\frac{19\pi}{3}$

10. Find the values of the remaining trigonometric functions of θ if $\cos\theta = -1/3$, and θ is in quadrant 2.

11. Graph: $y = -3\sin\left(\frac{1}{2}x + \frac{\pi}{2}\right)$

12. Find the exact value: $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

13. Establish the identity: $\frac{\sin x + \cos x}{\sin x} - \frac{\cos x - \sin x}{\cos x} = \sec x \csc x$

14. Find the exact value: $\sin\left[2\cos^{-1}\frac{1}{2}\right]$

15. Solve for x: $\sin x = -\cos x$

16. A guy wire 70 feet long is attached to the top of a radio transmission tower, making an angle of 60° with the ground. How high is the tower?

17. Find the area of a triangle with a = 5, b = 3, and c = 3.

18. Rewrite using polar coordinates: $x^2 = y$.

19. Graph in polar coordinates: $r = 5\cos\theta$

20. Find the complex cube roots of 1 + i.

21. Find the dot product of **v** and **w** if $\mathbf{v} = 2\mathbf{i} - \mathbf{j}$, and $\mathbf{w} = -3\mathbf{i} + 4\mathbf{j}$.

22. Find the cross product of **v** and **w** if $\mathbf{v} = \mathbf{i} - \mathbf{j} + \mathbf{k}$, and $\mathbf{w} = -\mathbf{i} + 2\mathbf{j}$.