1. Find the slope-intercept form of the line through the point: \((-2, 3)\), and:

a. perpendicular the line \(y = -2x - 5\)  

b. parallel to the line \(x = -4\)

2. For the function, \(f(x) = x^2 - 3x + 5\), find and simplify the difference quotient.  
\[
\frac{f(x + \Delta x) - f(x)}{\Delta x}
\]

3. Find the exact solutions to the equation:  
\[
2x^2 - 5x + 1 = 0
\]
4. Algebraically and/or graphically, determine the domain of the function:

a. \( f(x) = x^2 + 2x - 4 \)

b. \( f(x) = |x - 1| + 2 \)

c. \( f(x) = \frac{x - 1}{x^2 - 4} \)

d. \( f(x) = \sqrt{x + 5} \)

e. \( f(x) = e^{-2x} \)

f. \( f(x) = \ln(x + 2) \)

g. \( f(x) = \sin(2x) \)

h. \( f(x) = \tan(x) \)

5. Use the graph of the function to determine the following:

a) domain

b) range

c) \( f(-2) \)

d) \( f(0) \)

e) \( f(1) \)

f) value(s) of \( x \) such that \( f(x) = 0 \)
6. The population of a small town in central PA was approximately 10,000 in 2000 and 12,000 in 2008. Assuming the population is increasing exponentially, find the population model, \( P = ae^{kt} \) where \( P \) is the population and \( t \) is the year with \( t = 0 \) corresponding to the year 2000.

7. Use the properties of logarithms to expand as a sum, difference, and/or multiple of logarithms. Simplify if possible. \( \ln \left( \frac{\sqrt{x^2 + 4}}{2e^4} \right) \)

8. Use the fact that \( \sin \theta = -\frac{3}{5} \), and \( \tan \theta < 0 \), to find all the trig ratios \( \theta \)

9. Draw the angle in standard position, convert to radians or degrees and find all the ratios the angle;

a. \( \theta = 225^\circ \)

b. \( \theta = -315^\circ \)

c. \( \theta = 540^\circ \)

d. \( \theta = \frac{3\pi}{4} \)

e. \( \theta = -\frac{11\pi}{6} \)

f. \( \theta = \frac{5\pi}{6} \)
10. Solve the equation for $x$, $0 \leq x < 2\pi$, without using a calculator.

a. $2\cos^2 x - \sin x - 1 = 0$

b. $\sin(2x) - \cos x = 0$

11. Evaluate without using a calculator:

a) $\arcsin\left(\frac{1}{2}\right)$

b) $\arctan\left(\sqrt{3}\right)$

c) $\arctan(-1)$

d) $\arcsin\left(-\frac{\sqrt{3}}{2}\right)$