1) a) Convert the angle $160^\circ$ to radian measure.
   b) Convert the angle $\frac{5\pi}{8}$ radians to degree measure.

2) a) Solve for $x$: \[
\frac{1}{3x} + \frac{1}{x+1} = \frac{1}{x^2 + x}
\]
b) Solve for $t$: \[
\sqrt{t^2 - 4} - 5 = 0
\]
c) Solve for $s$: \[
s^4 + 3s^2 - 6 = 0.
\]

3) Find the domain and range of the following functions. Write your answer using interval notation.
a) \[f(x) = -4 - \sqrt{9 - x^2}
\]
b) \[w(t) = 4\sin(3t + 1) - 2
\]
c) \[g(x) = \sin\sqrt{x^2 - 1}
\]

4) a) Write the slope-intercept form for the equation of the line through the two points $(7, 5)$ and $(2, 8)$.
b) Write the slope-intercept form for the equation of the line through the point $(3, 5)$ that is parallel to the line \(y = 3x + 4\).
c) Write the slope-intercept form for the equation of the line through the point $(-3, 5)$ that is perpendicular to the line \(y = 3x + 4\).

5) Simplify the following expressions as much as possible using only positive exponents in your answer.
a) \[\left(\frac{2x^2z^{-5}}{3z^4}\right)^{-5}
\]
b) \[\left(\frac{x^{2/3}y^{3/5}}{y^{-5/3}x^{4/5}}\right)^{1/3}
\]
c) \[\left(\frac{x^{2/3}y^{1/7}}{z^{1/3}}\right)^5
\]

6) What are the amplitude, period, and centerline, of the following sinusoidal functions?
a) \[w(t) = -3\sin(3t - \pi) - 2
\]
b) \[f(x) = 2\cos(\pi x + 1) + 5
\]

7) Determine the symmetries, if any, of the following functions: Justify your answer.
a) \[g(t) = \tan(t^3 - t^2)
\]
b) \[g(t) = \cos(t^3 - t)
\]
c) \[g(t) = \frac{t^4 - t^2}{t^3 - t^5}
\]

8) What are the vertex and intercepts of the parabola \(f(x) = x^2 + x - 3\)?
9) A person is flying a kite on 50 feet of string. Assume the string is released from ground level.
   a) Write down an equation that will determine just how high is it above the ground, if its height is 10 feet more than the horizontal distance from the person flying it? Let the variable \( x \) represent the horizontal distance from the kite to the person.
   b) Solve the equation to determine how high the kite is flying.

10) We are mixing a 6.7% HCL solution by combining a 5.7% HCl solution with a 8.2% solution.
    a) Write down an equation that will determine how much 5.7% solution should be mixed with 120cc’s of the 8.2% solution to obtain the 6.7% solution.
    b) Solve the equation in part a and determine how much 5.7% solution is actually needed.

11) You are depositing $10,000 into two different savings accounts. One account yields 8.5% interest. The other account yields 6.5% interest. After one year you have earned a total of $790.
    a) Write down an equation that described this situation.
    b) How much money did you invest in the account with 8.5% interest?

12) A pottery wheel has a diameter of 28 centimeters. a) Through what angle (in radians) must the wheel turn to move a point on the edge of the disk 7 meters? b) If the wheel is turned another 120° how much farther does that point move?

13) You are standing on top of a 100 m building. The angle of elevation from horizontal to the top of a nearby building is 45°. When you move back 20 feet, the angle of elevation is then 30°.
    a) Write down an equation(s) that will determine the height of the nearby building?
    b) Solve the equation in part a, and determine the actual height exactly.
Graph at least two periods of the following functions indicating appropriate scales.

a) \( w(t) = 3\sin(3t) - 2 \)

b) \( f(x) = 2\cos(\pi x) + 1 \)
15) The function $y = f(x)$ is shown below. Graph the function $g(x) = -2f(x - 2) + 3$ on the same axis.