**Instructions:** Show all work.  Use exact answers unless specifically asked to round.  Answer all parts of each question.

1.  Evaluate the following expressions.

    a.  $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

    b.  $\tan^{-1}(1)$

    c.  $\sec^{-1}(-2)$

2.  Evaluate the following expressions and write them without any trig functions.

    a.  $\cos^{-1}(\sin x)$

    b.  $\tan^{-1}\left(\cos\frac{4\pi}{3}\right)$

    c.  $\sin(\sec^{-1}(-1))$

    d.  $\cot\left(\tan^{-1}\left(-\frac{5}{12}\right)\right)$

3.  Sketch the graph of $f(x) = 2\arctan(x - 1) + 3$. State the domain and range.