1. Find the equation of the line which passes through \((-1,4)\) and is perpendicular to the line with equation 3\(x + y + 2 = 0\). 

\[ \Rightarrow y = -3x - 2 \]

The slope is \(-\frac{1}{-3} = \frac{1}{3}\).

Equation \(y - 4 = \frac{1}{3}(x + 1)\) or \(y = \frac{1}{3}x + \frac{13}{3}\).

2. Let \(f(x) = \frac{x+1}{x-3}\), for \(x \neq 3\). Find a formula for the inverse function \(f^{-1}(x)\) and its domain.

\[ y = \frac{x+1}{x-3} \Rightarrow y(x-3) = x+1 \]

\[ (y-1)x = 3y + 1 \]

\[ x = \frac{3y+1}{y-1} \]

\[ f^{-1}(x) = \frac{3x+1}{x-1} \]

Domain \(x \neq 1\).
3. Find a simplification of \( \tan(\arcsin x) \).

\[
\tan(\arcsin x) = \frac{\sin(\arcsin x)}{\cos(\arcsin x)} = \frac{x}{\sqrt{1 - \sin^2(\arcsin x)}} = \frac{x}{\sqrt{1 - x^2}}
\]

4. Find all real numbers that satisfy the double inequality \( 0 \leq 1 - \log_2(x^2) < 3 \).

First, \( \log_2(x^2) \leq 1 \) gives \( x^2 \leq 2 \) or \( -\sqrt{2} \leq x \leq \sqrt{2} \).

But \( x \) cannot be 0, so \( (\sqrt{2}, 0) \cup (0, \sqrt{2}] \).

Second, \( \log_2(x^2) > -2 \) gives \( x^2 > \frac{1}{4} \) so

\( x < -\frac{1}{2} \) or \( x > \frac{1}{2} \).

Answers: \( [-\sqrt{2}, -\frac{1}{2}) \cup (\frac{1}{2}, \sqrt{2}] \).