Assignment 3-3

1) $\arcsin\left(\frac{\sqrt{3}}{2}\right) = \frac{\pi}{3}$

2) $\arctan(-1) = -\frac{\pi}{4}$

3) $\arccos\left(-\frac{1}{2}\right) = \frac{2\pi}{3}$

4) $\arctan(\sqrt{3}) = \frac{\pi}{3}$

5) $\arctan(3-x) = -\frac{\pi}{4}$

$3-x = \tan\left(-\frac{\pi}{4}\right)$

$3-x = -1$

$\underline{-3 \qquad -3}$

$\frac{-x}{-1} = \frac{-4}{-1}$

$x = 4$

6) $\arccos(x^2-2) = \pi$

$x^2 - 2 = \cos(\pi)$

$x^2 - 2 = -1$

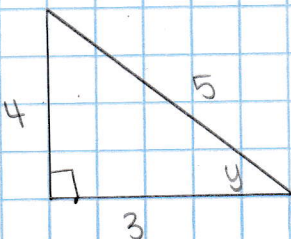$\underline{+2 \qquad +2}$

$\sqrt{x^2} = \sqrt{1}$

$x = \pm 1$

7) Find $\cos(y)$ given $y = \arcsin\left(-\frac{4}{5}\right)$
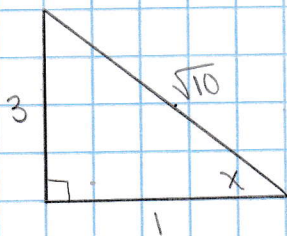
QIV

$\sin(y) = -\frac{4}{5}$

$\cos(y) = \frac{3}{5}$

8) Find $\sin(x)$, given that $x = \arctan(3)$

$\tan(x) = \frac{3}{1}$

$1^2 + 3^2 = c^2$

$\sqrt{1+9} = \sqrt{c^2}$

$c = \sqrt{10}$

$\sin(x) = \frac{3}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}}$

$= \frac{3\sqrt{10}}{10}$

9) $y = 2\arctan(3x)$

$y' = \frac{2(3)}{1+(3x)^2}$

$y' = \frac{6}{1+9x^2}$

10) $f(x) = \arcsin(x^2-1)$

$f'(x) = \frac{2x}{\sqrt{1-(x^2-1)^2}}$

11) $g(y) = \arcsin(e^{-y})$

$g'(y) = \frac{-e^{-y}}{\sqrt{1-(e^{-y})^2}}$

12) $h(t) = \arctan(t^{3/2})$

$h'(t) = \frac{\frac{3}{2}t^{1/2}}{1+(t^{3/2})^2}$

13) $y = x^2 \arccos(x)$

$y' = 2x\arccos(x) + (x^2)\left(\frac{-1}{\sqrt{1-(x)^2}}\right)$

14) $f(\theta) = \arctan(\ln(\theta))$

$f'(\theta) = \frac{\frac{1}{\theta}}{1+(\ln(\theta))^2}$

$f'(\theta) = \frac{1}{\theta(1+(\ln(\theta))^2)}$