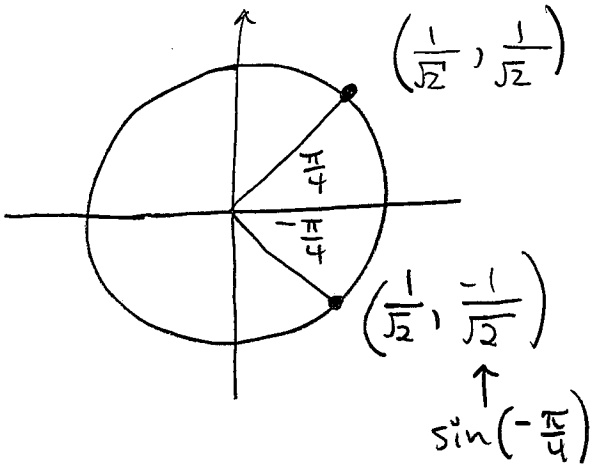
(1) [5] Determine the exact value of $\arcsin(-1/\sqrt{2})$.

$\arcsin\left(\frac{-1}{\sqrt{2}}\right)$ = angle $\theta \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ such that $\sin\theta = \frac{-1}{\sqrt{2}}$



$\therefore \arcsin\left(-\frac{1}{\sqrt{2}}\right) = -\frac{\pi}{4}$.

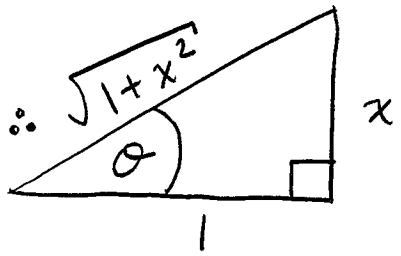
(2) [5] Determine the derivative and simplify: $H(x) = (1+x^2)\arctan(x)$.

$H'(x) = 2x\arctan(x) + \cancel{(1+x^2)}\left(\cancel{\frac{1}{1+x^2}}\right)$

$= 1 + 2x\arctan(x)$.

(3) [5] Simplify $\cos(\arctan x)$. Your final simplified answer should not contain any trigonometric or inverse trigonometric functions.

Let $\theta = \arctan x$, so $\tan\theta = \frac{x}{1}$:



$$\therefore \quad \cos(\arctan x) = \cos(\theta) = \frac{1}{\sqrt{1+x^2}}$$