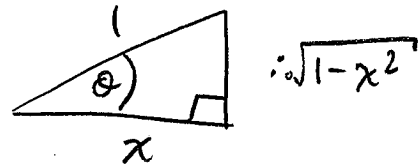


(1) [5] Simplify $\sin(\arccos x)$. (Your final simplified answer should not contain any trigonometric or inverse trigonometric functions.)

$$\text{let } \theta = \arccos x$$

$$\text{so } \cos \theta = \frac{x}{1} ;$$



$$\sin(\arccos x)$$

$$= \sin \theta$$

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

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

(2) [5] Determine the derivative and simplify: $y = \sin^{-1}(e^x) + \cos^{-1}(e^x)$.

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

$$= \boxed{0}$$

(3) [5] Determine $f'(0)$ if $f(x) = x \sinh(x) - \cosh(x^2)$.

$$f'(x) = 1 \cdot \sinh(x) + x \cosh(x) - \sinh(x^2)(2x)$$

$$\therefore f'(0) = \cancel{\sinh(0)} + 0 \cdot \cosh(0) - \cancel{\sinh(0)} \cdot 0$$

$$= \boxed{0}$$