

## Quiz # 5 — 10/16/14

Compute the derivative of following functions.

1.  $f(x) = \sqrt{\cos^2(x) + \sin(x) + 2}$

*Solution:*

$$\begin{aligned} f'(x) &= \frac{1}{2}(\cos^2(x) + \sin(x) + 2)^{-1/2}(\cos^2(x) + \sin(x) + 2)' \\ &= \frac{1}{2}(\cos^2(x) + \sin(x) + 2)^{-1/2}(2\cos(x)(-\sin(x)) + \cos(x)) \\ &= \frac{1}{2}(\cos^2(x) + \sin(x) + 2)^{-1/2}(-2\cos(x)\sin(x) + \cos(x)). \end{aligned}$$

2.  $h(x) = \ln(\cos^{-1}(x))$       (Recall that  $\frac{d}{dx} \cos^{-1}(x) = -\frac{1}{\sqrt{1-x^2}}$ .)

*Solution:*

$$\begin{aligned} h'(x) &= \frac{1}{\cos^{-1}(x)} [\cos^{-1}(x)]' \\ &= \frac{1}{-\sqrt{1-x^2} \cos^{-1}(x)}. \end{aligned}$$