AP Calculus Study Guide: section 3.9

Calculate g(b) and $g'(b)$, where g(x) = $f^{-1}(x)$.

f(x) = $2^x + 3^x$ b = 13

$g'(13) = \frac{1}{f'(2)} = \frac{1}{4\ln 2 + 9\ln 3}$

$2^x + 3^x = 13$

$x = 2$

$f(2) = 13$

$g(13) = 2$

$f'(x) = 2^x \ln 2 + 3^x \ln 3$

g(b) = 2

$g'(b) = \frac{1}{4\ln 2 + 9\ln 3}$

Find $\frac{dy}{dx}$ at x = 2 if y = $\tan^{-1}x$

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

$y' = \frac{1}{1+2^2} = \frac{1}{5}$

$\frac{dy}{dx} = \frac{1}{5}$

Find $\frac{dy}{dx}$ at x = 2 if y = $\sec^{-1} 5x$

$\frac{dy}{dx} = \frac{1}{|5x|\sqrt{25x^2-1}}$ 5^- $= \frac{1}{|x|\sqrt{25x^2-1}}$

$\rightarrow \frac{1}{2\sqrt{25(4)-1}} = \frac{1}{2\sqrt{99}}$

$\frac{dy}{dx} = \frac{1}{2\sqrt{99}}$