

Quiz 6 is due at the beginning of class on Tuesday, March 18. If you think you will miss that class or you will be late, then you should turn in this quiz before Tuesday.

For full credit, show all steps, using correct notation. Present the exact value of all solutions.

- (2 points) Prove that if f is a linear function with slope m , then f^{-1} is also linear.
- (2 points) Prove that $\frac{d}{dx}(\sin x) = \cos x$.
- (2 points) Compute the inverse function for $f(x) = \frac{3x - 2}{5x + 1}$.
- (2 points) Find all maximums and minimums of $f(x) = 4x + \frac{5}{x}$.
 - (2 points) Use the second derivative test to verify which points are maximums and which are minimums.
- (2 points each) Differentiate each of the following functions.
 - $f(x) = \frac{x^3 - 2x + 1}{\log_5 x}$
 - $f(x) = \tan x$
- (2 points each) Compute each of the following antiderivatives.
 - $\int x^2 + \sqrt{x} + 1 + \frac{1}{\sqrt{x}} + \frac{1}{x^2} dx$
 - $\int 3ab^2c^3 db$
- (4 points) Find c that satisfies the mean value theorem for $f(x) = \log_2 x$ on $[2, 8]$
- (5 points) A right triangle whose hypotenuse is $\sqrt{3}$ m long is revolved about one of its legs to generate a right circular cone. Find the radius, height, and volume of the cone of greatest volume.

