

SOLUTIONS TO POW 3/10/10

For each of the functions below, find its first derivative (1 pt each).
Simplify your answer (1 pt each).

Note: Though it may be tempting to think there's a typographical error below, there is NOT.

1. $f(x) = \tan(\sin x)$
 $f'(x) = \sec^2(\sin x) \cos x$

$f(x) = \sec(x^2 + 1)^2$
2. $f'(x) = \sec(x^2 + 1)^2 \tan(x^2 + 1)^2 (2)(x^2 + 1)(2x)$
 $f'(x) = 4x(x^2 + 1)\sec(x^2 + 1)^2 \tan(x^2 + 1)^2$

$f(x) = \frac{2\cos^2 x - 1}{4\sin x \cos x}$
 $f(x) = \frac{\cos 2x}{2\sin 2x}$
3. $f(x) = \frac{1}{2} \cot 2x$
 $f'(x) = -\frac{1}{2} \csc^2 2x (2)$
 $f'(x) = -\csc^2 2x$

$f(x) = \cot^3 3x$
4. $f'(x) = (3\cot^2 3x)(-\csc^2 3x)(3)$
 $f'(x) = -9\cot^2 3x \csc^2 3x$

$f(x) = \tan 2x \csc 2x$
 $f(x) = \frac{\sin 2x}{\cos 2x} \cdot \frac{1}{\sin 2x}$
5. $f(x) = \frac{1}{\cos 2x}$
 $f(x) = \sec 2x$
 $f'(x) = 2 \sec 2x \tan 2x$

POW 3/17/10

Complete the following integrals. Show the work that leads to your answer.

1. $\int_0^{1/2} \cos(\pi x) dx$

2. $\int \sqrt{\cos x} \sin x dx$

3. $\int x \sec^2(x^2) dx$

4. $\int 3 \cot^2 4x dx$

5. $\int_{-\pi/4}^{\pi/4} \tan^2 x \sec^2 x dx$