

No Calculator. Show your work in details and provide reasons to support your answers.

1. (12pt) Compute  $f'(x)$ . It is NOT required to simplify the result.

a.  $f(x) = \left(x + \frac{1}{\sqrt{x}}\right)(x^2 + 1)^{2008}$

b.  $f(x) = \left(\sin(x) + (1 - x^2)^2\right)^5$

c.  $f(x) = 5 \tan(x^2) + \sqrt{\cos(\pi x) + 1}$

d.  $f(x) = \frac{e^{-3x}}{2^{1-x}}$

2. (4pts) Find the equation of the tangent to the curve  $y = \frac{6}{x^2 + 1}$  at the point where  $x = 2$ .