

## Math 122

Midterm  
May 2003

Justify all your answers.

1. Find  $\tan'(x)$ .
2. Find a formula for  $\tan(\alpha+\beta)$  in terms of  $\tan(\alpha)$  and  $\tan(\beta)$ .
3. Given a function  $f(x)$  differentiable three times at 0 find a polynomial  $p(x)$  such that

$$\begin{aligned}f(0) &= p(0) \\f'(0) &= p'(0) \\f''(0) &= p''(0) \\f'''(0) &= p'''(0).\end{aligned}$$

4. Graph the following functions with greatest possible care.

$$f(x) = x^4 - x^3 + x - 1$$

$$g(x) = \frac{x(x+5)(x-4)}{(x-1)^2}$$