MATH 153 Summer 2005 Calculus

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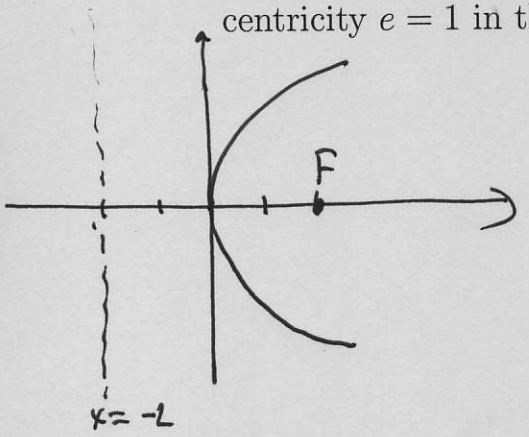
Name: _____

Quiz 2

1. (10 points) Graph the conic with directix $x = -2$ and focus $(2, 0)$ with eccentricity $e = 1$ in the cartesian plane. Write the equation for this conic.



$y^2 = 4px$ where $p = 2$

$\boxed{y^2 = 8x}$

2. (10 points) Find the Taylor series expansion for $\arctan(x^2) = \tan^{-1}(x)$

[**hint:** $\arctan(x) = \int_0^x \frac{1}{1+t^2} dt$]

$$\frac{1}{1+x^2} = \frac{1}{1-(-x^2)} = \sum_{k=0}^{\infty} (-x^2)^k = \sum_{k=0}^{\infty} (-1)^k x^{2k}$$

$$\tan^{-1}(x) = \int \frac{1}{1+x^2} dx = \int \left(\sum_{k=0}^{\infty} (-1)^k x^{2k} \right) dx = \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k+1}}{2k+1}$$