Math 1300-018 Quiz 5 Name:_____

1. Find the derivatives of the following functions. You need not simplify the result.

   (a) $2^x + x^2$

   (b) $\sin(\sin(\sin x))$

   (c) $\dfrac{x^3}{\frac{x}{3} + \frac{3}{x}}$

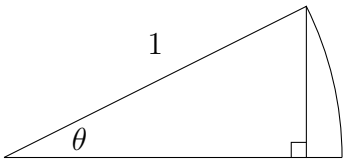
   (d) $x^5 e^{\tan x}$

   (e) $\cos(x^2)\cos^2 x$

2. For what values of r is $y = e^{rx}$ a solution of

$$y'' - 4y' + y = 0?$$

3. Consider the diagram:



If $S(\theta)$ is the area of the sector and $T(\theta)$ is the area of the triangle, what is

$$\lim_{\theta \to 0^+} \frac{S(\theta)}{T(\theta)}?$$