

1. (a) 1
 (b) $+\infty$
 (c) 2
 (d) 1
2. (a) $\pi x^{\pi-1} - \frac{4}{x^5} + \frac{(x^2+2)1-(x+1)(2x)}{(x^2+2)^2}$
 (b) $\frac{3x^2}{1+x^3} \sec x + \ln(1+x^3) \sec x \tan x$
 (c) $x^{\cos x} \left(\frac{\cos x}{x} - \sin x \ln x \right)$
 (d) $7 \left(\frac{e^{x^2}}{8+\tan x} \right)^6 \frac{(8+\tan x)e^{x^2}(2x) - e^{x^2} \sec^2 x}{(8+\tan x)^2}$
3. $y - \frac{\pi}{2} = \frac{-\pi}{2+\pi}(x-1)$
4. Not covered this term.
5. $\frac{1816}{\sqrt{108^2+80^2}}$
6. $(2, \frac{1}{12})$ (+ justification!)
7. (a) yes, $y = 1$
 (b) $x = 0$
 (c) both limits are $-\infty$
 (d) $\frac{-2x+8}{x^3}$
 (e) increasing on $(0, 4)$, decreasing on $(-\infty, 0)$ and $(4, \infty)$, local max at $(4, 3/4)$
 (f) concave up on $[6, \infty)$, concave down on $(-\infty, 6]$, inflection point at $(6, 11/9)$.
 (g) graph
8. Not covered this term.
9. $e^{\sin(x^2)} 2x$
10. (a) $-1/18$
 (b) $-\frac{(\cot(2x))^2}{4} + C$
11. 4