Chapter 7 Derivatives Review

1. Evaluate the limit.
2. $\lim\_{x\to 0}\frac{3x-\sin(x)}{x}$ b. $\lim\_{x\to \infty }\frac{2^{x}}{x^{2}}$

2. Calculate y’.

 a. $xy^{4}+x^{2}y=x+3y$ b. $x^{2}cosy+sin2y=xy$ c. $\sin(\left(xy\right))=x^{2}-y$

 d. $xtany=y-1$ e. $y=2^{-x^{2}} f. y=xtan^{-1}x $

 g. $y=log\_{10}(1+x^{2})$ h. $y=\left(cosx\right)^{x}$ i. $y=tan^{-1}(sin^{-1}\sqrt{x })$

3. Find an equation of the tangent to the curve at the given point.

 a. $y=\left(2+x\right)e^{-x} , (0,2)$ b. $y=xlnx , (e,e)$

 c. $x^{2}+4xy-y^{2}=13 , (2, 1)$

4. If a point moves on the curve $x^{2}+ y^{2}=25$, find $\frac{d^{2}y}{dx^{2}}$ at (0,5).

5. Let $f\left(x\right)=\frac{1}{4}x^{3}+x-1$, and let $f^{-1}$ denote the inverse of f. Then $(f^{-1})'(3)$ is equal to ?

6. If f(4) = 5 and f’(4) = 2/3, then calculate $(f^{-1})'(5)$.