MAC 2311 Hybrid Calculus I (B)

Section **3.1**

1. Use the limit definition of the derivative (only) to find the slope of the tangent line to

$f\left(x\right)=\sqrt{x+3}$ at the point (1, 2)

2. Use the limit definition of the derivative (only) to find a function that gives the slope of the tangent line to $g\left(x\right)=\frac{1}{x+1}$.

3. Use the limit definition of the derivative (only) to find the equation of the tangent line to $h\left(x\right)=x^{2}+1$ at $x=1.$

4. Given the graph of $ f\left(x\right) $sketch the graph of$ f'\left(x\right)$.

  

5.If the line tangent to the curve *y* = *f* (*x*) at (5, 18) is $y$ = 4*x* – 2, then $\lim\_{h\to 0}\frac{f\left(5+h\right)-f(5)}{h}=$

6. If the line tangent to the curve *y* = *g* (*x*) at (5, 18) is $y$= 4*x* – 2, then $\lim\_{x\to 5}\frac{g\left(x\right)-g(5)}{x-5}=$

7. True/False: if a function is continuous, it is differentiable; and if a function is differentiable it is continuous. Explain with examples.

8. Give 3 different cases, with examples, when a function is not differentiable.