Analysis H
Calculus Ch 1 – 3 Review

Name_____

1. $\lim_{x\to 5}\dfrac{x^2-25}{x-5}=$

2. $\lim_{x\to\infty}\dfrac{2x^2+3}{x^2-4}=$

3. If $f(x)=2+\dfrac{1}{x-3}$ *find* $\lim_{x\to 3^+} f(x)=$ $\lim_{x\to 3^-} f(x)=$

$\lim_{x\to -\infty} f(x)=$ $\lim_{x\to \infty} f(x)=$

4. Find the definite integral of $f(x)=-0.1x^2+7$ on the interval [0,5] using 5 increments.

5. A sports car accelerated in such a way that its velocity as a function of time is given by $v(t)=15t^{0.6}$.

a) Find an equation for x(t), the displacement of the car from a fixed point

b) Find a unique displacement function if x(1) = $7\frac{3}{8}$

6. Find values of the constants *a* and *b* that make the function differentiable at x = 2.

$$f(x)=\begin{cases}-(x-3)^2+7 & \text{if } x\geq 2\\ ax^3+b & \text{if } x<2\end{cases}$$

7. Find the particular function that has the given derivative:

$f'(x)=\sin(x)$ *and* $f(\pi)=8$

$f'(x)=x^2+12x-7$ *and* $f(3)=10$

Use the given table to answer the next two questions:

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
0	2	1	5	-4
1	3	2	3	-3
2	5	3	1	-2
3	10	4	0	-1

8. If $B = f(g(x)) + 3(f(x))^2$, then $B'(1) =$

9. If $M = f(g(x^2))$, then $M'(1) =$

10 If $D = \left[f(x) + g(x)\right]^3$, then $D'(2) =$

11. Let $f(x) = \begin{cases} \dfrac{x^2 + x}{x} & \text{if } x \neq 0 \\ 1 & \text{if } x = 0 \end{cases}$

Which of the following statements is (are) true?

I. $f(0)$ exists II. $\lim_{x \to 0} f(x)$ exists III. $f(x)$ is continuous

a) I only b) II only c) I and II only

d) all of them e) none of them

12. If $f(x) = x + 2\cos(x)$, then the equation of the tangent line to the graph through the point $\left(\frac{\pi}{2}, \frac{\pi}{2}\right)$ is

$y = x$ $x + y = \pi$ $x + y = 2$ $y = x - \pi$ $y - \frac{\pi}{2} = -2\left(x - \frac{\pi}{2}\right)$