MAC 2311 Hybrid Calculus I (B)

**Sections 2.1-2.3**

1.The position of an object moving along a line is given by the function *s*(*t*) = *t* 2 − 2*t*.

a) What is the average velocity over the interval [1, 2]? ANS: 1

b) What is the instantaneous velocity at the point *t* = 1? ANS: 0

2. Find the slope of the tangent line to at**.** ANS: 4

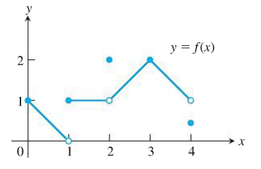
3. 3. For defined below, approximate in the table below. If the limit Does Not Exist (DNE), explain why. ANS: 3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *x* | 0.1 | 0.01 | 0.001 | 0.0001 | 0.00001 |
| *g*(*x*) | 2.9 | 2.99 | 2.999 | 2.9999 | 2.9999 |

4. For find two (2) of the most appropriate values of slopes of secant lines to make a conjecture about the slope of the tangent line at *x* =1. ANS: 3.99, 4.01, Average 4

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *x* | 0.97 | 0.99 | 1.00 | 1.01 | 1.03 |
| *h*(*x*) | 6.8809 | 6.9601 | 7 | 7.0401 | 7.1209 |

5. Evaluate: If the limit DNE explain:



a) 1 b) 1 c) 0

d) DNE e) 2 f) 1

g) 1 h) 2 i) 0.4

j) DNE k) 1 l) DNE

6. 2

7. -1/4

8. 1/4

9. DNE

10. 5

11. For *x* real, find. ANS: DNE

12. True/ False; the limit DNE if. Explain. ANS: false; see #6,7,8 above.