

East Los Angeles College
Department of Mathematics
Math 261
Test 2 Study Guide

Show Work for Credit

Let $s(t) = 2t^3 - 7t^2 + 4t + 1$ be a position function measured in meters where t is measured in seconds and $t \geq 0$

1. Determine the average velocity over the interval $[1,2]$
2. Determine the initial position.
3. Determine the velocity function.
4. Determine the initial velocity.
5. Determine the velocity at $t=3$ seconds.
6. Determine the direction of travel at $t=3$ seconds.
7. Determine the speed at $t=3$ seconds.
8. At what time t does the particle stop?
9. For what time interval t is the particle moving to the right?
10. For what time interval t is the particle moving to the left?
11. Determine the acceleration function.
12. What is the acceleration at $t=3$ seconds?
13. Is the particle speeding up or slowing down at $t=3$ seconds?
14. Determine the acceleration of the particle when velocity is 0.

15. Show that $f(x) = |x + 4|$ is not differentiable at $x = -4$

16. Determine the equation of the line tangent to the curve at the indicated point.

$$f(x) = 4(3x + 1)^5 \text{ at } (0,4)$$

17. Determine the points of horizontal tangents for $y = \cos(2x) + \sin(2x)$ over $0 \leq x \leq 2\pi$

18. Use implicit differentiation to find the equation of the line tangent to the curve at the indicated point.

$$x^2 + 2y^2 = 1 \text{ at } \left(0, \frac{\sqrt{2}}{2}\right)$$

Differentiate the following functions.

19. $f(x) = \sqrt[3]{4 + \sin(x)}$

20. $f(x) = 2x\sqrt{x+3}$

21. $f(x) = \frac{\sqrt{x}}{x-6}$

22. $f(x) = \sec(\sqrt{x})$

Answer Sheet

1		12	
2		13	
3		14	
4		15	
5		16	
6		17	
7		18	
8		19	
9		20	
10		21	
11		22	