

MA16010 Course Objectives

1. Section 2.1:
 - (a) Find the domain of a given function.
 - (b) Find the composition of two given functions.
2. Section 2.2: Evaluate limit of a function as $x \rightarrow a$ or as $x \rightarrow \infty$ or as $x \rightarrow -\infty$.
3. Section 2.3, 2.4: Familiarity with limit definition of derivative. Use the four step process to find the derivative of a function.
4. Section 2.5: Find the derivative of a given polynomial.
5. Section 2.6:
 - (a) Find velocity and/or acceleration from displacement function of time.
 - (b) Find acceleration from velocity.
 - (c) Find time intervals in which object is moving to the left or to the right.
 - (d) Find time instants at which the object is at rest.
 - (e) Find time intervals when the object is speeding up and/or speeding down.
6. Section 2.7: Find derivative of a function using product rule and/or quotient rule and/or chain rule.
7. Section 2.8:
 - (a) Find dy/dx using implicit differentiation.
 - (b) Find the slope and/or equation of tangent and/or normal to a given curve at a given point.
8. Section 2.9: Find the second derivative of a given function.
9. Section 3.1: Find the maximum and/or minimum points and/or values of a given function.
10. Section 3.2: Find the inflection points of a given function. Sketch the graph of a given function.
11. Section 3.4: Find minimum and/or maximum of a quantity (such as volume, area, perimeter, sum/product of two numbers) in a real world application.
12. Section 3.6: To find absolute/relative error in a quantity B, given error in quantity A, where A and B are related by some formula.
13. Section 6.1, 6.2, 6.3: Find derivative of a given trigonometric function.
14. Section 6.4, 6.5: Find derivative of a given inverse trigonometric function.
15. Section 6.6, 6.7, 6.8: Find derivative of a given exponential and/or logarithmic function. Use logarithmic differentiation to find derivatives of functions of the form $[f(x)]^{g(x)}$.
16. Section 4.1: Find antiderivative of a given algebraic function.
17. Section 4.2: Evaluate a definite integral as limit of a sum.
18. Section 4.3: Evaluate definite integrals and/or find areas under curves using the fundamental theorem of calculus.
19. Section 4.4, 4.5: Evaluate integrals using the substitution method and the power rule for integration.
20. Section 4.6: Find areas bounded by given curves by expressing them as a definite integral.
21. Section 4.7: Evaluate improper integrals, when either the limits of integration are infinite or when the integrand is discontinuous at some point in the interval of integration.
22. Section 4.9: Find approximate value of a definite integral using the Trapezoidal or the Simpson's rule for some given value of n .
23. Section 5.2: Find volume of a solid generated by revolving a given area/region about the x -axis using the Disk/Washer method.
24. Section 5.3: Find volume of a solid generated by revolving a given area/region about the y -axis using the Cylindrical shell method.