# Curriculum Tentative Schedule

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| Chapter's Title | Topic/Activity | Examples | Exercises | Due to Week No. |
|---|---|---|---|---|
| **Chapter P** Preliminaries | **P.1 "** Real numbers and the real line **"** Intervals-Inequalities-Absolute value. | 2(a,b), 3(a), 4(a), 6, 7 **Add examples**: Solve $x^2-5x+6>0$, $\|x-6\|\geq 5$, $\|x+4\|>6$ | 14, 15, 18, 21, 28, 29, 35, 37 **Solve** $x^2-9\geq 0$ | **One** |
| | **P.2 "** Cartesian coordinates in the plane **"** Axis scales-Distances-Graphs-Straight line-Equations of lines. | 2, 3, 6-11 **Solve Exercise 31** | 1, 3, 13, 15, 16, 21, 23, 25, 27, 28, 31, 32 | **Two** |
| | **P.3 "** Graphs of quadratic equations **"** Explain the polynomial function which is found in part 6 page 39. Shifting a graph. | 8, 9 | 35-38 | |
| | **P.4 "** Functions and their graphs **"** Definition of function-The domain convention-Graphs of functions-Even and odd functions. | 2-7 **Solve Exercises 11, 12, 18** | 1, 3, 4, 5, 11-14, 17, 18, 29, 30 | **Three** |
| | **P.5 "** Combining functions to make new functions **"** Sums, differences, products, quotients, multiples-Composite functions-Piecewise defined functions**.** | 3-4, 6-10 | 1, 7, 9, 25 | |
| | **P.7 "** The trigonometric functions **"** Definition 6-Definition 7-Some useful identities-Some special angles-The additional formulas-Other trigonometric functions. | 1-5, 7 | 1, 3, 5, 7, 9, 13, 16, 25, 29 | **Four** |
| | **1-** Convert from degrees to radians (a) $45^\circ$ (b) $120^\circ$ (c) $12^\circ$ (d) $270^\circ$<br>**2-** Convert from radians to degrees (a) $\frac{2\pi}{3}$ (b) $\frac{\pi}{3}$ (c) $\frac{5\pi}{6}$ (d) $\frac{3\pi}{4}$<br>**3-** If the radius of a circle is 9 cm, what angle is subtended by an arc of 12 cm?<br>**4-** If a circle has radius 4 cm, what is the length of an arc subtended by a central angle of $\frac{3\pi}{4}$ rad? | | | |

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| **Chapter 1** Limits and Continuity | **1.2 “** Limits of functions **”** Definition1-One-Sided limits-Rules for calculating limits-The Squeeze Theorem. | 1, 3, 4(a, c), 5-7, 9, 10 | 1, 7, 9, 11, 13, 14, 17, 18, 20, 22, 23, 30, 61, 63, 66, 74, 75 | |
| | **1.3 “** Limits at infinity and infinite limits **”** Limits at infinity-Limits at infinity for rational functions-Infinite limits. | 1-5, 8, 9, 10 | 1, 3, 4, 5, 8, 9, 11, 13, 14, 23, 29, 35, 37, 43, 47, 49 | **Five** |
| | **1.4 “** Continuity **”** Continuity at a point-Continuity on an interval-Continuous extensions and removable discontinuities. | 1-5, 6(a, b, c, d), 8 | 1, 7, 9, 13, 14, 17, 18 | |
| | **EXAM 1** | | | **Six** (Initial appointment) |
| **Chapter 2** Differentiation | **2.1 “** The tangent lines and their slopes **”** Defintion1-Definition2-Definition3-Normals | 1, 4, 6, 7 | 1, 3 | **Seven** |
| | **2.2 “** The derivative **”** Definition4-Some important derivatives-Leibniz notation. | 1, 2(a), 3 | 11, 31, 35, 37, 41, 43 | |
| | **2.3 “** Differentiation rules **”** Sum and constant multiples-The product rule-The reciprocal rule-The quotient rule. | 1, 3, 4, 7-9 | 1, 5, 7, 9, 10, 13, 15, 19, 21, 28, 42 | |
| | **2.4 “** The chain rule **”** The chain rule-Building the chain into differentiation formulas. | 1, 2, 3(a), 5(a) | 1, 4, 7, 8, 31, 36 | ` **Eight** |
| | **2.5 “**Derivatives of trigonometric functions**”** Some special limits-The derivative of sine and cosine-The derivatives of the other trigonometric functions. | Find $\lim_{x\to 0}\frac{\sin 2x}{x}$, 2, 3, 5 | 3, 5, 7, 11, 13, 15, 17, 26, 29, 31, 35, 53 | |
| | **2.6 “** Higher-Order derivatives **”** | 2, **Find** $y^{(3)}$ **if** $y = 3x^4 - x^3 + 2x - 15$ $y = x\sin x$ | 1, 3, 9, 11 | **Nine** |
| | **2.8 “** The Mean-Value Theorem **”** Increasing and decreasing functions - Theorem 12 | 4 | 8, 9, 11 | |
| | **2.9 “** Implicit Differentiation **”** Implicit Differentiation | 1, 3 | 1, 3, 5 | |

<table>
<tr><td rowspan="5">Chapter 3<br>Transcendental Functions</td><td>3.1 “ Inverse functions ”<br>Definition1 - Defintion2 - Properties of inverse functions</td><td>1, 2</td><td>1, 3, 5, 6, 9</td><td rowspan="3">Ten</td></tr>
<tr><td>3.2 “ Exponential and logarithmic functions ”<br>Definition 4 - laws of exponents<br>Definition 5 - laws of logarithms</td><td>3-4</td><td>1, 3, 5, 7, 9, 13, 15, 21, 23, 24</td></tr>
<tr><td colspan="3">1- Solve the following equations:<br>(1) $2^{x-2}=8$ (2) $3^{2x-4}=9$ (3) $4^{x-1}=8$ (4) $9^{x+1}=27$<br><br>2- Simplify the following mathematical expressions:<br>(1) $\log_5 125$ (2) $\log_{1/3} 3^{2x}$ (3) $\log 25+\log 4$ (4) $\log_2 64-\log_2 32+\log_2 2$<br>(5) $\log_3 27-\log_3 81+5\log_3 3$ (6) $5^{2\log_5 2}$ (7) $(\log_4 16)(\log_4 2)$</td></tr>
<tr><td colspan="3">EXAM 2</td><td>Eleven<br>(Initial appointment)</td></tr>
<tr><td>3.3 “The natural logarithm and exponential”<br>Natural logarithm and its derivative - Natural exponential its derivative - The general logarithm and its derivative - The general exponential and its derivative</td><td>first part of 1, 2-3</td><td>1, 3, 5, 7, 11, 12, 19, 21, 23, 25, 31, 33, 37, 42, 44</td><td>Twelve</td></tr>
<tr><td rowspan="3">Chapter 4<br>More Applications of Differentiation</td><td>4.4 “ Extreme Values ”<br>Maximum and minimum values-Critical points-Local extreme values-The first derivative test.</td><td>1 below</td><td>5 (find abs. max and abs. min),<br>18-20 (find local max and local min)</td><td rowspan="3">Thirteen</td></tr>
<tr><td>4.5 “ Concavity and inflections ”<br>Concave up and concave down-Inflection points.</td><td>2 below</td><td>2, 3, 4, 5</td></tr>
<tr><td colspan="3">Example (1):<br>Find, critical points, the absolute maximum point and the absolute minimum point of the function $f(x)=3x^2-12x+1$ in $[0,3]$.<br>Example (2):<br>If $f(x)=x^3-3x^2-9x+2$, find the following:<br>1- The critical points 2- Increasing intervals 3- Decreasing intervals<br>2- Local maximum value 4- Local minimum values 5- Concave upward intervals<br>7- Concave downward intervals 8- Inflection points.</td></tr>
<tr><td colspan="3">General Revision</td><td>Fourteen</td></tr>
</table>

- **Textbook:**

  **“** General Mathematics for Preparatory Year Students ”

  Compiled from: Robert A. Adams and Christopher Essex**,** *Calculus*: *A complete course*, Eighth Edition.

- **Curriculum Policy:**

  The information of

  1. distributing the grades,
  2. missing Exams I or II, and
  3. DN of attendance,

  will be determined later by the MATH 101' High Committee.

*Best Wishes*