

AP CALCULUS PORTFOLIO

WRITTEN/PROJECT ASSIGNMENTS: Orientation day Sept, 2019

- Requirements:**
- 1) Small binder or folder with shanks.
 - 2) Design a cover for your portfolio.
 - 3) All assignments for the portfolio must be typed, labeled, and hole-punched. Most assignments **will require graphs** to demonstrate an understanding of the topic. Label all graphs appropriately.
 - 4) Evaluation will be based on the following:
 - thoroughness, attention to detail, correct and adequate use of terminology, legibility and accurateness of examples, grammar, spelling, & timely submission.
 - 5) All sources must be cited.

UNIT 1 Relations & Functions

Describe, explain and provide examples

Assignment 1) Write a detailed exposition on the following:

- A) Domain: define and how it is determined
 - 1) Discontinuities: define and they are determined
 - a) Removable: define and they are determined
 - b) Holes: define and they are determined
 - 2) Non-Removable: define and they are determined
 - a) Vertical asymptotes: define and they are determined

Assignment 2) Write a detailed exposition on the following:

- B) Range: define and how it is determined
 - 1) Horizontal asymptotes: define
 - a) How they are determined
 - b) How they pertain to end behavior
 - 2) Oblique asymptotes define.
 - a) How they are determined
 - b) How they pertain to end behavior

Assignment 3) Write a detailed exposition on the following:

- C) Provide graphs for the family of functions

Include: Quadratic, Square Root, Cubic, Cube Root, Quartic, Quintic, Reciprocal Function (Rational), Exponential for $b > 1$ & $0 < b < 1$, Logarithmic $b > 1$ & $0 < b < 1$, Absolute Value, the 6 Trigonometric Functions, and the 6 Inverse Trigonometric Functions

Assignment 4) Write a detailed exposition on the following:

- D) Symmetry:
 - 1) Explain the tests for symmetry over the x-axis, the y-axis, the origin, the line $y = x$ and the line $y = -x$
 - 2) An odd function: define and give examples
 - 3) An even function: define and give examples

Assignment 5) Write a detailed exposition on the following:

E) Periodicity: define and give examples using the 6 Trigonometric Functions

Assignment 6) Write a detailed exposition on the following:

F) Zeros: define and give examples including the maximum number and the concept of multiplicity.

Assignment 7) Write a detailed exposition on the following:

G) Intercepts: define and give examples.

Assignment 8) Write a detailed exposition on the following:

H) Graphing techniques: Define, provide the proper notation and illustrate through examples for: (Include members of the family of functions and the Trigonometric functions.)

- 1) Horizontal translations: define and how it is determined
- 2) Horizontal shrinks/compressions: define and how it is determined (Include impact on period of Trigonometric functions.)
- 3) Horizontal stretches: define and how it is determined (Include impact on period of Trigonometric functions.)
- 4) Vertical translations: define and how it is determined (Include impact on amplitude of Trigonometric functions.)
- 5) Vertical shrinks/compressions: define and how it is determined (Include impact on amplitude of Trigonometric functions.)
- 6) Vertical stretches: define and how it is determined (Include impact on amplitude of Trigonometric functions.)
- 7) End behavior of the family of functions and the Trigonometric functions: define and how it is determined
- 8) Reflections: define and how it is determined
 - (a) over the x-axis: define and how it is determined
 - (b) over the y-axis: define and how it is determined

Assignment 9) Write a detailed exposition on the following:

I) Average Rate of Change: define and how it is determined

Assignment 10) Write a detailed exposition on the following:

J) Maximum and Minimum Values:

- 1) Relative and absolute maximum.
- 2) Relative and absolute minimum

Assignment 11) Write a detailed exposition on the following:

K) Intervals of increase, decrease and constancy

Assignment 12) Write a detailed exposition on the following:

L) Limit statements at the location of vertical asymptotes, holes, and end behavior.

Due: Orientation day September, 2019.