

# Chapter 3.2: Derivatives of Exponential Functions

## Calculus I

College of the Atlantic. October 17, 2024

Determine the derivative of the following functions:

1.  $f(x) = 4^x$

2.  $f(x) = 5(2)^x$

3.  $f(x) = x^2 + 2^x$

4.  $f(x) = 17 + 42\sqrt{x} - 9^x$

5.  $f(x) = \pi^x + x^\pi + e^x + e^\pi + \pi^e + x^\pi$

6.  $f(x) = \frac{2x^3 + xe^x}{x}$

7.  $f(x) = xe^x$

A small college is growing<sup>1</sup> at a rate of 4% a year. In 2024 the college has 350 students.

1. Write down a formula for the number of students at the college as a function of the years since 2024.
2. What is the enrollment in 2030?
3. What is the rate of growth in 2030?

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<sup>1</sup>This is not true. COA has no plans to grow its enrollment.