

§4.7: ANTIDERIVATIVES

1.] Find the antiderivative of the following functions:

a.) $f(x) = 1$

b.) $f(x) = 100x^{99}$

c.) $h(x) = \sec(x) \tan(x)$

d.) $g(x) = \frac{1}{x}$

e.) $g(x) = -\csc^2(x)$

f.) $g(x) = -\frac{1}{\sqrt{1-x^2}}$

2.] Find the general antiderivative of $f(x) = e^x - 2x$. Then find the particular antiderivative that satisfies $F(0) = -2$.

3.] Find the general antiderivative of each of the following functions:

a.) $f(x) = 4x^3 + 1 + \cos(x)$

b.) $g(x) = x^2 + 3x + \sin(x)$

c.) $h(x) = 2^x$

4.] Find the general antiderivative of each of the following functions:

a.) $f(x) = 3x^5 + 2 - 5x^{-2/3}$

b.) $g(x) = (x^2 + 1)(2x - 5)$

c.) $h(x) = \frac{4x^{19} - 5x^{-8}}{x^2}$, where $x \neq 0$.

5.] Solve the initial value problem given by

$$f'(x) = 7x \left(x^6 - \frac{1}{7} \right) \quad f(1) = 2.$$

6.] Solve the initial value problem given by

$$f''(x) = x + \frac{1}{\sqrt{x}} \quad f'(4) = 6, \quad f(4) = 0.$$