

### **(3.2) Derivatives of Polynomial and Exponential Functions**

Instructions: Find the derivative at the given point using the derivative rules

1)  $g(x) = -\frac{1}{3}x^7$

2)  $f(x) = 3\sqrt{x}$

3)  $f(x) = 2e^{x+1}$

4)  $h(x) = -\sqrt[5]{y^2}$

5)  $g(x) = \frac{2}{x^5}$

6)  $h(x) = 10x^{-3.4}$

7)  $f(x) = 3x^3 - 2x + \sqrt{x}$

8)  $g(x) = 3x^2 + 6\left(\sqrt[3]{x^2}\right)$

9)  $y = 4\sqrt{x} - \frac{1}{x^2} - \frac{3}{x^3}$

10)  $g(x) = 2x^5 + 4x^3$

$$11) \quad f(x) = e^x - 17x^{3/17}$$

$$12) \quad g(x) = \frac{2x^5 + 4\sqrt{x}}{x^3}$$

$$13) \quad f(x) = 45x - 45$$

$$14) \quad g(x) = x^7 + 7\sqrt{x}$$

$$15) \quad f(x) = \frac{A\sqrt{x} - Bx}{x^2}$$

$$16) \quad g(x) = a\sqrt[5]{x^3} + \sqrt{7}$$

Answers:

$$1) g'(x) = -\frac{7}{3}x^6$$

$$2) f'(x) = \frac{3}{2}x^{-\frac{1}{2}}$$

$$3) f'(x) = 2e^{x+1}$$

$$4) h'(x) = -\frac{2}{5}y^{-\frac{5}{7}}$$

$$5) g'(x) = -10x^{-6}$$

$$6) h'(x) = -34x^{-4.4}$$

$$7) f'(x) = 9x^2 - 2 + \frac{1}{2\sqrt{x}}$$

$$8) g'(x) = 6x + 4x^{-\frac{1}{3}}$$

$$9) y' = \frac{2}{\sqrt{x}} + \frac{2}{x^3} + \frac{9}{x^4}$$

$$10) g'(x) = 10x^4 + 12x^2$$

$$11) f'(x) = e^x - 3x^{\frac{14}{17}}$$

$$12) g'(x) = 4x - 10x^{-\frac{7}{2}}$$

$$13) f'(x) = 45$$

$$14) g'(x) = 7x^6 + \frac{7}{2\sqrt{x}}$$

$$15) f'(x) = -\frac{3}{2}Ax^{-\frac{5}{2}} + Bx^{-2}$$

$$16) g'(x) = \frac{3}{5}ax^{-\frac{2}{5}}$$