

Pre Calc BC**5- More derivs****Name:**

1. Find the derivatives of the functions below.

a) $y = x^4 + 2x^3 - 7x^2 + 5x - 7$

b) $y = 2\sin x - 5\cos x$

c) $y = x^e - e^x$

d) $y = 1/x^3$

e) $y = x + 1/x$

f) $y = \square \cdot \sin(x)$

g) $y = e \cdot e^x$

h) $y = 99,999x$

i) $y = \sqrt[3]{x^2} + \sqrt[2]{x^5}$

2. Use derivatives to answer the following questions

a) When does the graph of $y = \sin(x)$ have a slope of 0.5?

b) When does the graph of $y = e^x$ have a slope of 1?

c) When does $y = \sqrt{x}$ have a slope of 0? Why?

d) What is the slope of $y = \sqrt[3]{x}$ when $x = 0$?

3. The vertical position of a yo-yo is given by $s(t) = 24 + 20\sin(t)$. Assume t in sec, s in inches, and $0 \leq t \leq 10$

a) Write an equation for the velocity of the yo-yo

b) What is the yo-yo's maximum velocity? What is its position at that time?

c) What is the yo-yo's velocity when it is first 10 inches from the ground?

d) How many seconds does it take for the yo-yo to complete a cycle?

4. Find the derivative of the following and evaluate at the indicated value of x . Check with nderiv.

a) $y = \frac{7}{x^3}$, at $x = 2$

b) $y = e^x + x^e$, at $x = 1$

c) $y = \sqrt[5]{x^3}$, at $x = 5$

5. Is there a power function whose derivative is $1/x$? Explain why, why not.