

**Ch. 2.2-2.3 Morning Quiz Review**

1. Find  $\frac{dy}{dx}$  if  $y = 7x^3(\sqrt{x} - 1) - \frac{2x^2}{11} + 4\pi x - 5\pi^4 + \sqrt[3]{x} + \frac{5}{2\sqrt{x^7}}$

2. If  $f(x) = \frac{x^2}{x-1}$  find  $f'(x)$ . Then write the equation of the line tangent to  $f(x)$  at  $x = -1$  in point-slope form.

3. Find the derivative of  $f(x)$  if  $f(x) = (x^3 - 2\sqrt{x^5})(2x - 5\pi^3 + 7)$

4. A particle moves along the x-axis (**in meters**) so that at times  $t \geq 0$  **seconds**, its position is given by  $x(t) = t^3 - 3t^2 - 9t + 2$

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a) Find the velocity and acceleration function

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b) What is its velocity at  $t = 2$  seconds? (provide units of measure)

c) What is its acceleration at  $t = 4$  seconds? (provide units of measure)

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d) At what times does the particle change directions? Justify

e) At  $t = 0$ , is the particle moving to the right or to the left? Justify.

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f) Find the average velocity of particle in  $[1, 3]$

g) What is displacement of particle from  $t = 1$  to  $t = 4$ ? Show work.

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h) What is the total distance of particle from  $t = 1$  to  $t = 4$ ? Show work.

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i) Is velocity increasing or decreasing at  $t = 2$ ? Justify.

j) Is the speed increasing or decreasing at  $t = 4$ ? Justify