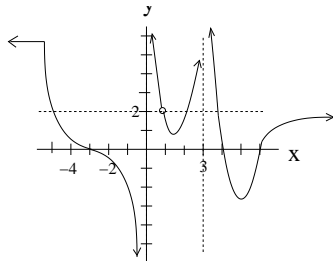


Math142 Week In Review # 5

The Most Important Problems to Understand - This Week

- Use the four-step process to find the derivative of $f(x) = 5 - 3x^2$.
- Find the derivative of $f(x)$ given that $f(x+h) - f(x) = \frac{3}{2x+2h-5} - \frac{3}{2x-5}$.
- Find the derivative using the limit definition of the derivative for $f(x) = \sqrt{4-3x}$.
- Using the function defined in #1 above, find the equation of the tangent to $f(x)$ at $x = -1$.
- An object moves along the y - axis as described by $y = x^2 + 2x$, where x is the time in seconds, and y is measured in feet.
 - Find the average velocity when x changes from 2 seconds to 5 seconds.
 - Find the instantaneous velocity at $x=2$ seconds.
- Refer to the graph of $f(x)$ below. List the values of x for which $f'(x)$ does not exist .



- The profit in dollars from the sale of " x " Wii © consoles is given by $P(x) = 200x - 0.01x^2 - 3000$.
 - Find the average change in profit if production changes from 7000 units to 8000 units.
 - Find $P'(x)$ using the limit definition of the derivative.
 - Find the instantaneous rate of change of profit at 7000 units.
 - As the plant manager, would you keep production the same, increase, or decrease production?
- Find the derivative, y' if
 - $y = x^{-4} + x^{\frac{3}{2}} - e^3$.
 - $y = \frac{1}{\sqrt[3]{x^2}}$.
 - $y = 4.2x^{-2} - \frac{0.5}{\sqrt[4]{x}} + 2$.
 - $y = x^2 - 1.5x - 10\sqrt{x}$.
 - $y = \frac{x^5 - 5x^3 - 2}{x^2}$.

- How can the derivative be used to find the maximum and minimum?
- The price-demand function and the cost function for the production of air-conditioning units is $x = 2000 - 0.25p$ and $C(x) = 60,000 + 200x$.
 - Find the average cost of making 100 units.
 - Find the marginal cost of making 100 units.
 - Find the marginal average cost when $x = 100$.
 - Find the revenue when 100 units are made and sold.
 - Find the average revenue when 100 units are made and sold.
 - Find the revenue of making and selling 25 units.
 - Find the approximate revenue from the 25th unit.
 - Find the marginal average revenue function.
 - What is the profit from making and selling 100 units?
 - What is the marginal profit function.
 - Find the marginal average cost function.
 - How many should they make and sell to maximize revenue?
 - How many should they make and sell to maximize profit?