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Unit 7: Calculus Quest Review

1. For the polynomial function ****

a: Find the derivative

b: Find the equation of the tangent line at x = 1

2. Find the values for x when the gradient of the tangent line is 4. $f\left(x\right)=x^{3}-2x^{2}+5x-16$

3. If the price charged for a candy bar is p(x) cents, then x thousand candy bars will be sold in a certain city, where $p\left(x\right)=125-\frac{x}{14}$. How many candy bars must be sold to maximize revenue?

Hint: Revenue = price times quantity, where quantity is x

4. A container in the shape of a right circulur cylinder with no top has surface area 3π ft2. What height, h, and base radius, r, will maximize the volume of the cylinder?

5. Consider the function, $f\left(x\right)= \frac{3}{2}x^{2}-5x-2$.

a. Calculate f(4). [2 marks]

b. Write down the y-intercept. [1 mark]

c. Determine the x-intercepts. [3 marks]

d. ketch the graph of the function $y=f(x)$ for $-5\leq x\leq 5$ and $-10\leq y\leq 10$. [4 marks]

e. Find $f'(x)$. [2 marks]

f. Find the coordinates of the minimum point. [2 marks]

g. Find the gradient of the tangent at x = 4. [2 marks]

h. Determine the equation of the tangent at x = 4. [2 marks]

i. Determine the equation of the normal at x = 4. [4 marks]