Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sequences, Series, and Calculus Test Review

1. Find the eighth term of each geometric sequence

 a. 3, 9, 27,… b. -3, 6, -12,…

2. In an arithmetic sequence, u9 = -23 and u25 = 25

a. Find the following information: [4 marks]

* Common Difference:
* First Term:

b. Find S25. [2 marks]

3. Determine if the sequences are arithmetic, geometric, or neither.

 If arithmetic, state the common difference

 If geometric, state the common ratio

 If neither, state why not

 a.) 3, 6, 9, 12,… b.) 3, 5, 9, 11,… c.) 4, 15, 26, 37,…

4. Determine the 13th term in the arithmetic sequence

 5, 13, 21,…

5. Determine the sum of the arithmetic series

 7 + 10 + 13 + … + 82

6. For the polynomial function ****

a: Find the derivative

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

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

8. 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

9. 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?

10. 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. Sketch 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]