**Calculator Free**

**Differentiation and**

**Anti-Differentiation**

Time: 45 minutes

Total Marks: 45

Your Score: / 45



**Question One: [1, 2, 2, 2, 3, 3 = 13 marks]**

Determine the gradient function for each of the following functions:

1. 
2. 
3. 
4. 
5. 
6. 

**Question Two: [2, 2, 3, 3 = 10 marks]**

1. The gradient function of is . Determine an expression for.
2. The gradient function of is . Determine an expression for .
3. The gradient function of is . Determine an expression for .
4. The gradient function of is . Determine if it passes through the point (-1, 6).

**Question Three: [3, 5, 5 = 13 marks]**

1. Determine the gradient of the function  at the point (2, -18).
2. Determine the equation of the tangent to the curve at .
3. Determine the coordinates of the point(s) on the curve  where the gradient is -24.

**Question Four: [3 marks]**

The function has a gradient of -2 at the point ( -1, -1). Determine the values of *a* and *b*.

**Question Five: [6 marks]**

The function  passes through the point (0, -4) and has a gradient of -15 at the point (-2, 10).

Determine the values of *a*, *b* and *c.*

**SOLUTIONS**

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