# DIFFERENTIATION QUIZ

Marks: /50
Name:
Time: 60 minutes

1. Differentiate $y = x^2 – 6x + 5 -5x^3$ (1 mark)

2. Differentiate $y = (x^2 + 6)^5$ (2 marks)

3. Differentiate $y = (x^3 + 2x^2 + 4x + 7) / (x^2)$ (2 marks)

4. Find the equation of the tangent to $y = 3x^3 + 4x^2$ when $x = 3$ (3 marks)

5. On the same set of axes, plot the function $y = x^3 - 2x$, the first derivative of that function and the second derivative of that function. (5 marks)

6. Find k if the tangent to $y = 2x^3 + kx^2 - 3$, at the point where $x = 2$ and has a slope of 4 (3 marks)

7. Find the equation of the tangent(s) to $y^2 - 3xy + x^3 = 3$, where $x = -1$ (4 marks)

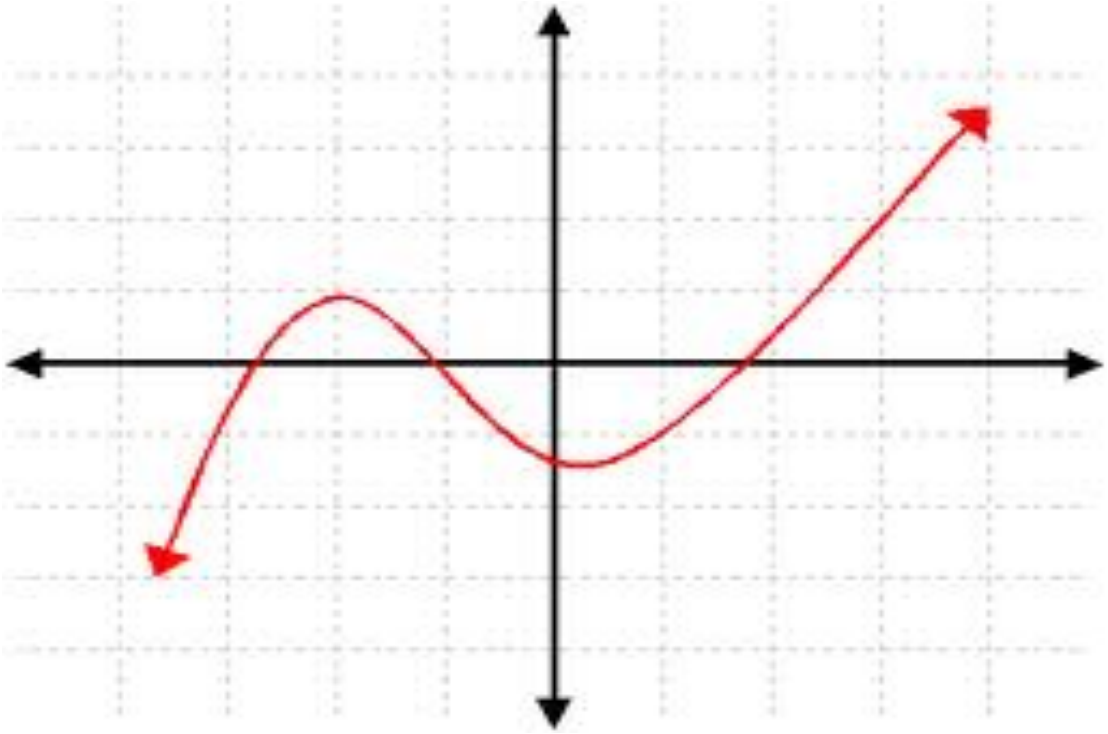
8. Find, using first principles, the f'(2) for the function $y = (x^2)/(5-x)$ (4 marks)

9. Find the equation of the normal to $y = 8\sqrt{x} - (1/x^2)$ (4 marks)

10. Differentiate the function $3y^4 + 6xy + y^2 + 14x + xy = 15$ (4 marks)

11. The tangent to the curve $y = x^2 + ax + b$, where a and b are constants, is $2x+y=6$ at the point where $x = 1$. Find the values of a and b. (5 marks)

12. Sketch the first and second derivative for this function on the same set of axes if the red line is f(x) (3 marks)



13. Find the point at which the tangent of $f(x) = x^3 - 5x$ at $x = -1$, rejoins the curve. (5 marks)

14. Find the slope of the tangent to: $y = 4/(x+2\sqrt{x})$ at $x = 4$ (5 marks)

END OF QUIZ