

Worksheet 10

1 day until the 1st exam

For the final ten days leading up to the first AS Maths exam paper (8MA0/01 for Edexcel), we will publish four exam questions. Three of the questions will focus on the Pure Mathematics content, and one of the questions will focus on Mechanics content. There will be no questions on Statistics content. The three questions will vary in difficulty, but they will usually increase in difficulty. You may use a calculator for any of the questions and solutions are provided on a separate document.

- 1 Given that $y = \frac{x^3 - 100x}{x^2 + 10x}$, show that $\frac{d^2y}{dx^2}$ is 0.
- 2 Given that the circle C has the equation $3x^2 + 3y^2 - 2x + 6y = 9$,
 - (a) find the centre and radius of C .
 - (b) Show that the point $P(0, 1)$ lies on C and find the tangent to C at P .
 - (c) Show algebraically that the tangent to C at P does not intersect C again.
- 3 Find set of values of integers k for which the line $(7 - k)x + y = -1$ does not intersect $y = x^2$.
- 4 Two particles P and Q hang freely under the influence of gravity. The particles are connected by a light inextensible string that passes over a fixed small smooth pulley. The particle P has mass 2 kg and the particle Q has mass 5 kg. The particles P and Q are 3 m above the ground.

The system is released from rest.

 - (a) Find the acceleration of the masses.
 - (b) Find the time taken for the particle Q to hit the ground.
 - (c) Calculate the maximum height reached by the particle P above the ground.

END OF WORKSHEET

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