A Level: **Exam Countdown** | CM

Worksheet 8 — 3 days until 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 $A(8, 0)$ and $B(0, -4)$.

(a) Explain why AB is the diameter of the circle passing through the points O, A and B, where O is the origin.

(b) Find the equation of the circumcircle of the triangle OAB.

2 The curve C has the equation $y = x(px - 2)(5x + q)$, where p and q are positive constants.

The curve C has a root at $x = -0.4$.

The maximum point on C occurs when $x = \frac{2}{15}\sqrt{3}$.

(a) Write down the value of q.

(b) Show that $p = 5$.

(c) Sketch the curve C.

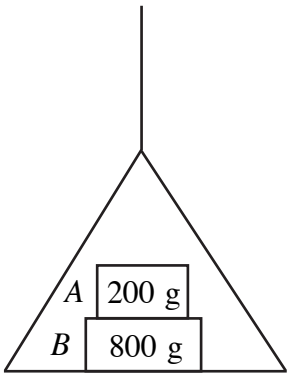
On your sketch, show clearly the coordinates of any points where the curve C crosses or meets the coordinate axes.

3 (a) Show that $x = 1$ is a solution to the equation $6x^3 - 7x^2 + 1 = 0$.

(b) Find all the solutions to the equation $6x^3 - 7x^2 + 1 = 0$.

(c) Solve the equation $6\cos^3\theta - 1 = 5 - 7\sin^2\theta$ for $0 \leq \theta \leq 360^\circ$.

4



A light lift is attached to a vertical light inextensible string. The lift carries the masses A and B. The mass of A is 200 g and the mass of B is 800 g. Mass A rests on top of mass B as shown in the diagram above. The lift is raised vertically at 3 m s^{-2}.

(a) Find the tension in the string.

(b) Calculate the magnitude of the force exerted on A by B.

(c) Write down the magnitude of the force exerted on B by A.

(d) Explain how you have used the fact that lift is light in your calculations.

END OF WORKSHEET