Questions taken from the WJEC Specimen Paper (Part 1)

Question	1	2	3	4	5	13	14	Total
Marks								
Max Marks	7	6	6	5	12	7	8	51

SPEND ABOUT AN HOUR ON THE QUESTIONS THEN CHECK AND CORRECT YOUR ANSWERS USING THE MARK SCHEME

The circle C has centre A and equation

$$x^2 + y^2 - 2x + 6y - 15 = 0$$
.

- (a) Find the coordinates of A and the radius of C.
- (b) The point P has coordinates (4, 7) and lies on C. Find the equation of the tangent to C at P. [4]
- Find all values of θ between 0° and 360° satisfying

$$7\sin^2\theta + 1 = 3\cos^2\theta - \sin\theta.$$
 [6]

[3]

- 3. Given that $y = x^3$, find $\frac{dy}{dx}$ from first principles. [6]
- 4. The cubic polynomial f(x) is given by $f(x) = 2x^3 + ax^2 + bx + c$, where a, b, c are constants. The graph of f(x) intersects the x-axis at the points with coordinates (-3, 0), (2.5, 0) and (4, 0). Find the coordinates of the point where the graph of f(x) intersects the y-axis. [5]
- The points A(0, 2), B(-2, 8), C(20, 12) are the vertices of the triangle ABC.
 The point D is the mid-point of AB.
 - (a) Show that CD is perpendicular to AB. [6]
 - (b) Find the exact value of tan CÂB. [5]
 - (c) Write down the geometrical name for the triangle ABC. [1]

YEAR 1 | MATHEMATICS | WEEK 23 EXAM QUESTIONS

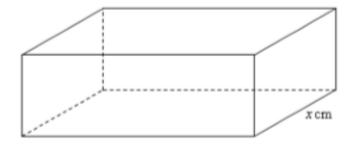
13. In triangle ABC, BC = 12 cm and $\cos A\hat{B}C = \frac{2}{3}$.

The length of AC is 2 cm greater than the length of AB.

(a) Find the lengths of AB and AC.

[4]

- (b) Find the exact value of sin BÂC. Give your answer in its simplest form.
 - n. [3]
- 14. The diagram below shows a closed box in the form of a cuboid, which is such that the length of its base is twice the width of its base. The volume of the box is 9000 cm³. The total surface area of the box is denoted by S cm².



- (a) Show that $S = 4x^2 + \frac{27000}{x}$, where x cm denotes the width of the base. [3]
- (b) Find the minimum value of S, showing that the value you have found is a minimum value. [5]