Questions taken from the WJEC Specimen Paper (Part 2)

Question	7	8	9	10	16	17	Total
Marks							
Max Marks	5	6	7	5	5	12	40

SPEND ABOUT 45 MINUTES ON THE QUESTIONS THEN CHECK AND CORRECT YOUR ANSWERS USING THE MARK SCHEME

7. Figure 1 shows a sketch of the graph of $y = f(x)$. The graph has a minimum point at $(-3, -4)$ and intersects the x-axis at the points $(-8, 0)$ and $(2, 0)$.

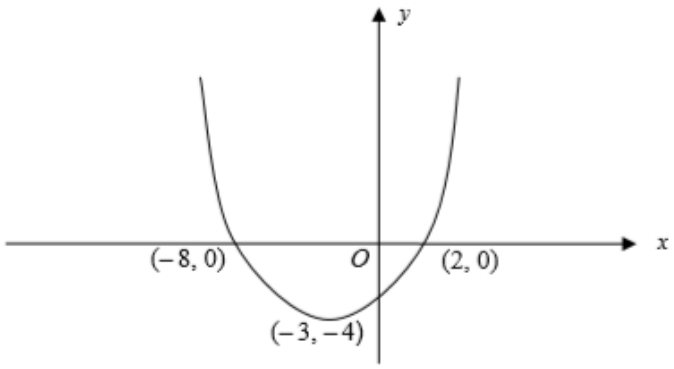


Figure 1

(*a*) Sketch the graph of $y = f(x + 3)$, indicating the coordinates of the stationary point and the coordinates of the points of intersection of the graph with the x-axis. [3]

(*b*) Figure 2 shows a sketch of the graph having **one** of the following equations with an appropriate value of either p, q or r.

$y = f(px)$, where p is a constant
$y = f(x) + q$, where q is a constant
$y = rf(x)$, where r is a constant

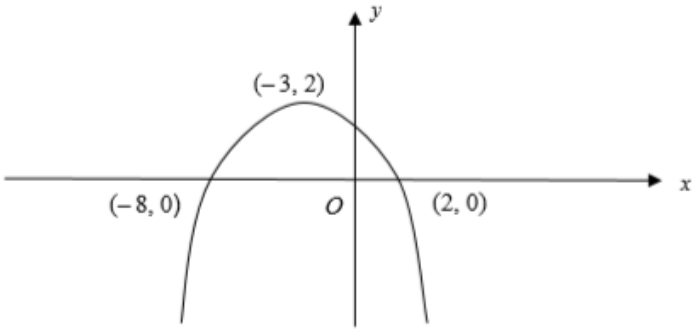


Figure 2

Write down the equation of the graph sketched in Figure 2, together with the value of the corresponding constant. [2]

8. The circle *C* has radius 5 and its centre is the origin.
The point *T* has coordinates (11, 0).
The tangents from *T* to the circle *C* touch *C* at the points *R* and *S*.

(*a*) Write down the geometrical name for the quadrilateral *ORTS*. [1]

(*b*) Find the exact value of the area of the quadrilateral *ORTS*. Give your answer in its simplest form. [5]

9. The quadratic equation $4x^2 - 12x + m = 0$, where m is a positive constant, has **two distinct** real roots.
Show that the quadratic equation $3x^2 + mx + 7 = 0$ has **no** real roots. [7]

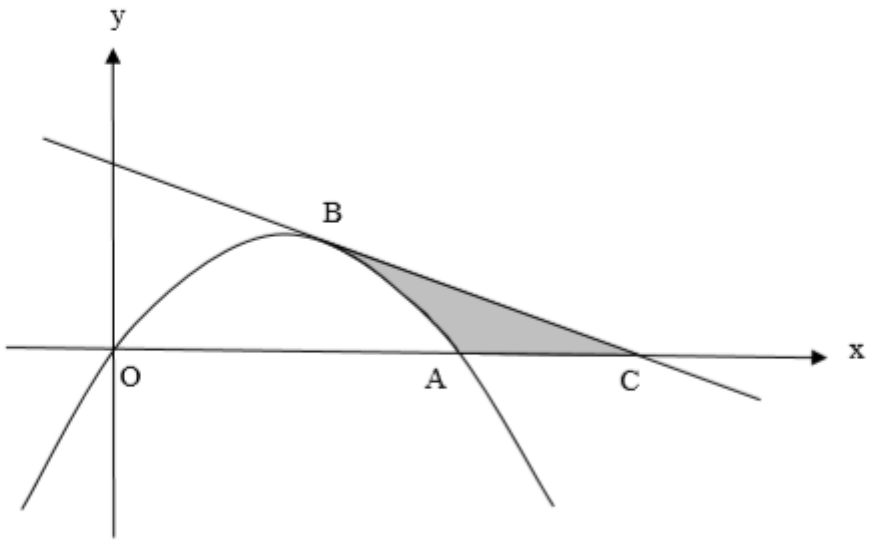
10. (*a*) **Use the binomial theorem** to express $\left(\sqrt{3} - \sqrt{2}\right)^5$ in the form $a\sqrt{3} + b\sqrt{2}$, where a, b are integers whose values are to be found. [5]

16. Find the range of values of x for which the function

$$f(x) = x^3 - 5x^2 - 8x + 13$$

is an increasing function. [5]

17.



The diagram above shows a sketch of the curve $y = 3x - x^2$. The curve intersects the x-axis at the origin and at the point *A*. The tangent to the curve at the point *B*(2, 2) intersects the x-axis at the point C.

(*a*) Find the equation of the tangent to the curve at *B*. [4]

(*b*) Find the area of the shaded region. [8]