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2. (a) Write down the value of $16^{\frac{1}{4}}$.

(1)

(b) Simplify $(16x^{12})^{\frac{3}{4}}$.

(2)

Q2

(Total 3 marks)



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5. (a) Write $\frac{2\sqrt{x+3}}{x}$ in the form $2x^p+3x^q$ where p and q are constants. **(2)**

Given that $y = 5x - 7 + \frac{2\sqrt{x+3}}{x}$, $x > 0$,

(b) find $\frac{dy}{dx}$, simplifying the coefficient of each term. **(4)**

Ruled lines for student answer.





Question 5 continued

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(Total 6 marks)

Q5



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6.

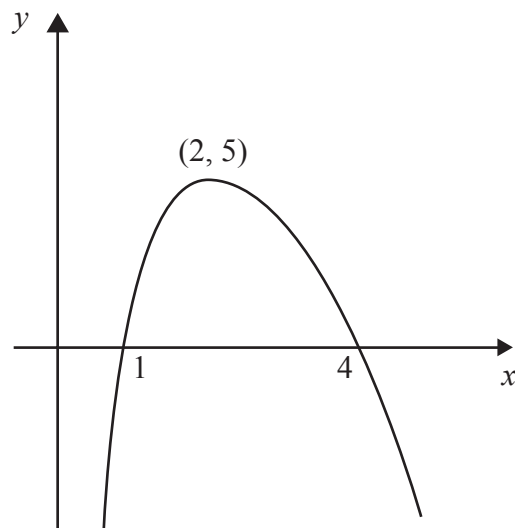
**Figure 1**

Figure 1 shows a sketch of the curve with equation $y = f(x)$. The curve crosses the x -axis at the points $(1, 0)$ and $(4, 0)$. The maximum point on the curve is $(2, 5)$.

In separate diagrams sketch the curves with the following equations.

On each diagram show clearly the coordinates of the maximum point and of each point at which the curve crosses the x -axis.

(a) $y = 2f(x)$, **(3)**

(b) $y = f(-x)$. **(3)**

The maximum point on the curve with equation $y = f(x + a)$ is on the y -axis.

(c) Write down the value of the constant a . **(1)**





Question 6 continued

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(Total 7 marks)

Q6



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Question 7 continued

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Q7

(Total 8 marks)





Question 9 continued

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(Total 10 marks)

Q9

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10. The curve C has equation

$$y = (x+3)(x-1)^2.$$

- (a) Sketch C showing clearly the coordinates of the points where the curve meets the coordinate axes. (4)

- (b) Show that the equation of C can be written in the form

$$y = x^3 + x^2 - 5x + k,$$

where k is a positive integer, and state the value of k . (2)

There are two points on C where the gradient of the tangent to C is equal to 3.

- (c) Find the x -coordinates of these two points. (6)





Question 10 continued

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N 2 5 5 6 1 A 0 1 7 2 4



Question 10 continued

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