

2. (a) Expand and simplify $(7 + \sqrt{5})(3 - \sqrt{5})$.

(3)

(b) Express $\frac{7 + \sqrt{5}}{3 + \sqrt{5}}$ in the form $a + b\sqrt{5}$, where a and b are integers.

(3)

Handwritten solution area with horizontal lines.

(Total 6 marks)

Q2



N 3 4 8 5 4 A 0 3 2 8

3. The line l_1 has equation $3x + 5y - 2 = 0$

(a) Find the gradient of l_1 . (2)

The line l_2 is perpendicular to l_1 and passes through the point (3, 1).

(b) Find the equation of l_2 in the form $y = mx + c$, where m and c are constants. (3)



6. The curve C has equation

$$y = \frac{(x+3)(x-8)}{x}, \quad x > 0$$

(a) Find $\frac{dy}{dx}$ in its simplest form. (4)

(b) Find an equation of the tangent to C at the point where $x = 2$ (4)



7. Jill gave money to a charity over a 20-year period, from Year 1 to Year 20 inclusive. She gave £150 in Year 1, £160 in Year 2, £170 in Year 3, and so on, so that the amounts of money she gave each year formed an arithmetic sequence.

- (a) Find the amount of money she gave in Year 10. (2)

- (b) Calculate the total amount of money she gave over the 20-year period. (3)

Kevin also gave money to the charity over the same 20-year period.

He gave £A in Year 1 and the amounts of money he gave each year increased, forming an arithmetic sequence with common difference £30.

The total amount of money that Kevin gave over the 20-year period was **twice** the total amount of money that Jill gave.

- (c) Calculate the value of A. (4)



Question 7 continued

Lined writing area for the answer to Question 7.

(Total 9 marks)

Q7



8.

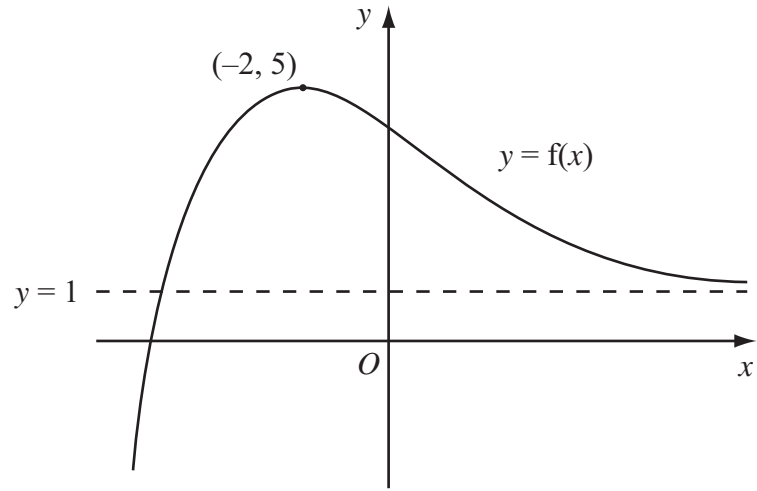


Figure 1

Figure 1 shows a sketch of part of the curve with equation $y = f(x)$.

The curve has a maximum point $(-2, 5)$ and an asymptote $y = 1$, as shown in Figure 1.

On separate diagrams, sketch the curve with equation

(a) $y = f(x) + 2$ (2)

(b) $y = 4f(x)$ (2)

(c) $y = f(x + 1)$ (3)

On each diagram, show clearly the coordinates of the maximum point and the equation of the asymptote.



Leave
blank

Question 8 continued

Q8

(Total 7 marks)



Question 9 continued

Lined area for writing the answer to Question 9.



Question 10 continued

Lined area for writing the answer to Question 10.

(Total 10 marks)

TOTAL FOR PAPER: 75 MARKS

END

Q10

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