

$$\frac{7 + \sqrt{5}}{\sqrt{5} - 1}$$

(4)

(Total 4 marks)

2. Find

$$\int \left(10x^4 - 4x - \frac{3}{\sqrt{x}} \right) dx$$

giving each term in its simplest form.

(4)

Q2

(Total 4 marks)



3. (a) Find the value of $8^{\frac{5}{3}}$

(2)

(b) Simplify fully $\frac{\left(2x^{\frac{1}{2}}\right)^3}{4x^2}$

(3)





5. Find the set of values of x for which

(a) $2(3x + 4) > 1 - x$

(2)

(b) $3x^2 + 8x - 3 < 0$

(4)





(a) Find the value of N .

The company then plans to continue to make 600 mobile phones each week.

(b) Find the total number of mobile phones that will be made in the first 52 weeks starting from and including week 1.

8.

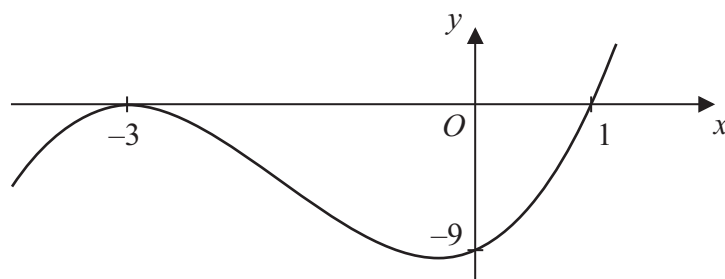


Figure 1

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

$$f(x) = (x + 3)^2 (x - 1), \quad x \in \mathbb{R}.$$

The curve crosses the x -axis at $(1, 0)$, touches it at $(-3, 0)$ and crosses the y -axis at $(0, -9)$

(a) In the space below, sketch the curve C with equation $y = f(x + 2)$ and state the coordinates of the points where the curve C meets the x -axis. (3)

(b) Write down an equation of the curve C . (1)

(c) Use your answer to part (b) to find the coordinates of the point where the curve C meets the y -axis. (2)





9.

$$f'(x) = \frac{(3 - x^2)^2}{x^2}, \quad x \neq 0$$

- (a) Show that $f'(x) = 9x^{-2} + A + Bx^2$,

where A and B are constants to be found.

(3)

- (b) Find $f''(x)$.

(2)

Given that the point $(-3, 10)$ lies on the curve with equation $y = f(x)$,

- (c) find $f(x)$.

(5)







11.

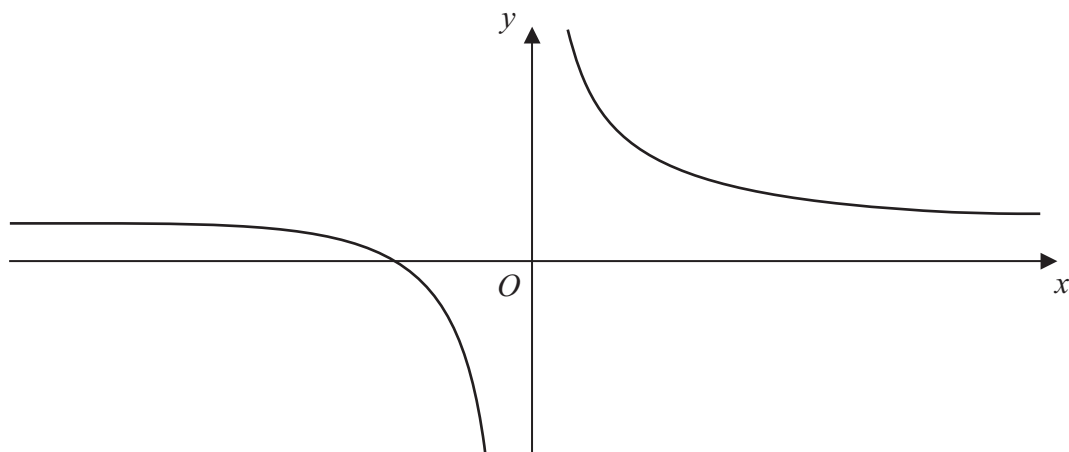


Figure 2

Figure 2 shows a sketch of the curve H with equation $y = \frac{3}{x} + 4$, $x \neq 0$.

- (a) Give the coordinates of the point where H crosses the x -axis. (1)
- (b) Give the equations of the asymptotes to H . (2)
- (c) Find an equation for the normal to H at the point $P(-3, 3)$. (5)

This normal crosses the x -axis at A and the y -axis at B .

- (d) Find the length of the line segment AB . Give your answer as a surd. (3)



END