

12Ma Pure Mini Test 04
Graphs and tangents

Question 1

The curve C has equation $y = (x - 2)(x - 4)^2$

(a) Show that $\frac{dy}{dx} = 3x^2 - 20x + 32$

[2]

The line l_1 is the tangent to C at the point where $x = 6$.

(b) Find the equation of l_1 , giving your answer in the form $y = mx + c$, where m and c are constants to be found.

[4]

The line l_2 is the tangent to C at the point where $x = a$.

Given that l_1 and l_2 are parallel and distinct.

(c) Find the value of a .

[3]

Question 2

The curve C has equation $y = \frac{4}{x} + k$, where k is a positive constant.

(a) Sketch a graph of C , stating the equation of

(i) any asymptote(s)

(ii) any point(s) of intersection with the axes

[2]

The line with equation $y = 10 - 2x$ is a tangent to C .

(b) Find the possible values for k .

[5]

(c) [**Bonus Marks**] Find the possible values for k using a **different** method.

[4]