Tutorial 3B: Graphing Techniques (Part 2) Transformation of Graphs

Basic Mastery Question

1. The diagram shows the graph of y = f(x), where f(x) = x(x-20). The points *A*, *B* and *C* have coordinates (0,0), (10,-100) and (20,0) respectively.



For each of the following transformations of this function:

- (i) describe the transformation(s) geometrically;
- (ii) write down an expression for the new function;
- (iii) sketch the graph of the transformed function, indicating the coordinates of the points corresponding to points *A*, *B* and *C*.

(a)
$$y = f(x) + 20$$

1.	(a)	(i)	Translation of 20 units in positive y-direction
		(ii)	y = x(x-20) + 20



(b) y = f(x - 10)





(e) y = -3f(x)

(iii)



B = (10, -500)

(3_-3)











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



(c)
$$y = f(2x-1)$$



Your diagrams should indicate the asymptotes and coordinates of the maximum point.

3. The diagram shows the graph of y = f(x).



Possible Equation:
$$y = \begin{cases} \frac{1}{x+1} & \text{if } x < -1 \\ \frac{x}{x^2-1} & \text{if } |x| < 1 \\ \frac{1}{x-1} & \text{if } x > 1 \end{cases}$$

On separate diagrams, sketch the graph of



(ii)
$$y = f(|x|)$$

