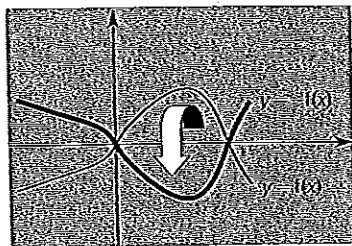
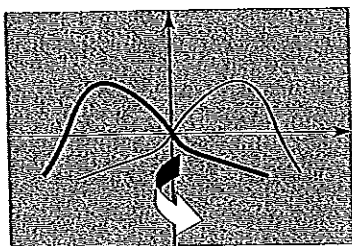


Transformations of curves

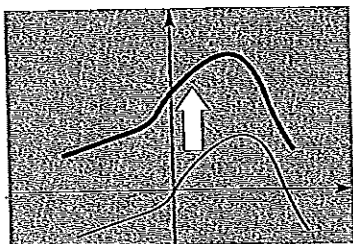
The curve $y = -f(x)$ is the reflection in the x -axis of the curve $y = f(x)$.



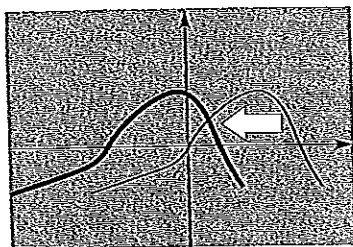
The curve $y = f(-x)$ is the reflection in the y -axis of the curve $y = f(x)$.



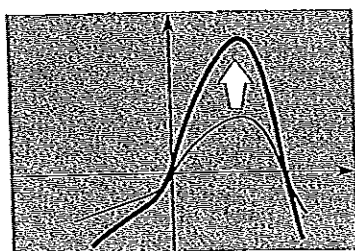
The curve $y = f(x) + a$ is the translation of the curve $y = f(x)$ by a units up the y -axis. If a is negative the curve moves down.



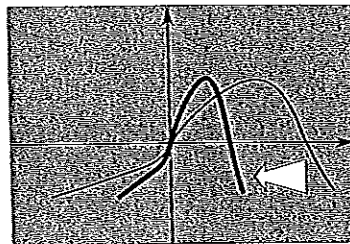
The curve $y = f(x + a)$ is the translation of the curve $y = f(x)$ by a units back along the x -axis. If a is negative, the curve moves forward along the x -axis.



The curve $y = af(x)$ is a one-way stretch of the curve $y = f(x)$ by a units parallel to the y -axis. When $a < 1$, the curve shrinks parallel to the y -axis.



The curve $y = f(ax)$ is a one-way reduction of the curve $y = f(x)$ by a units parallel to the x -axis. When $a < 1$, the curve expands parallel to the x -axis.

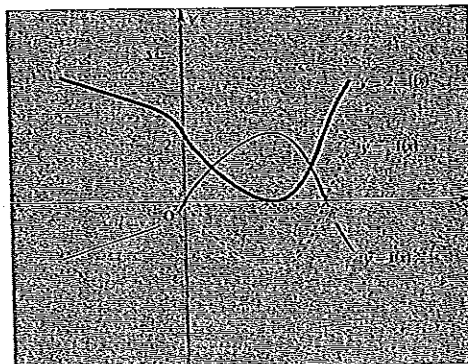


Compound transformations

To sketch a compound transformation of a curve $y = f(x)$, start with a sketch of $y = f(x)$, then identify the order of the transformations and apply them to the given curve in that order,

e.g. to sketch the curve $y = 2 - f(x)$

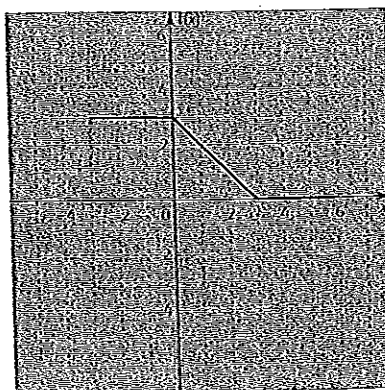
you need to recognise that $y = 2 - f(x)$ is the compound transformation 'reflect $y = f(x)$ in the x -axis then translate it two units up the y -axis'. Start by sketching $y = f(x)$, reflect it in the x -axis to give $y = -f(x)$, then lift this 2 units.



Question

The diagram shows a sketch of $y = f(x)$. Sketch the curve

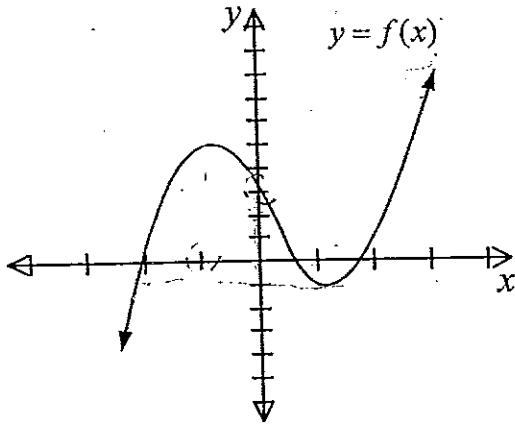
- a $y = f(x + 2)$
- b $y = \frac{1}{3}f(x)$
- c $f(3x) - 2$



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Exercise 8: Transformation Of Graphs

Q2 The graph of $y = f(x)$ is drawn below. By drawing a quick sketch in each case, match up the following equations with their corresponding graphs.



(i) $y = f(x) + 3$

(vi) $y = f(x-2) + 2$

(ii) $y = f(x) - 3$

(vii) $y = 2f(x)$

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

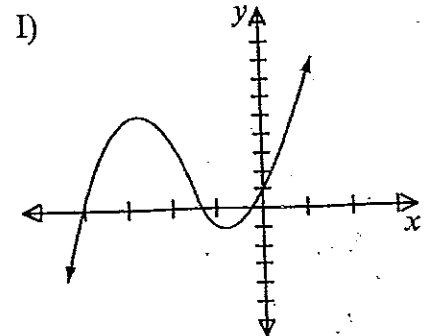
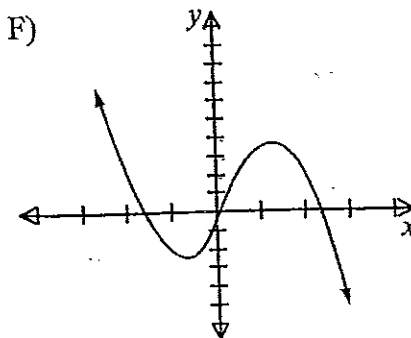
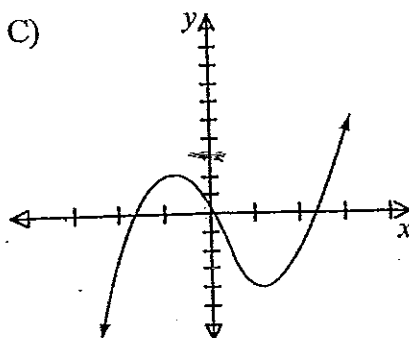
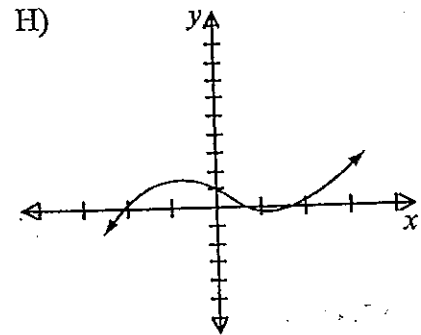
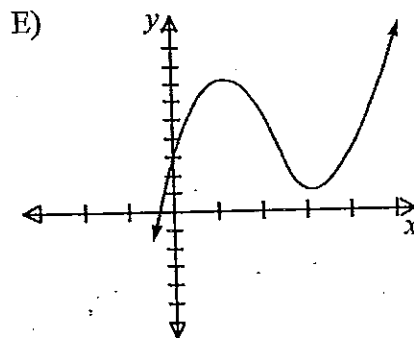
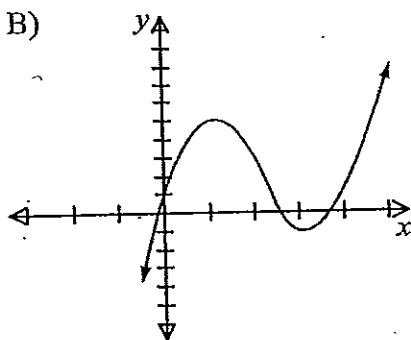
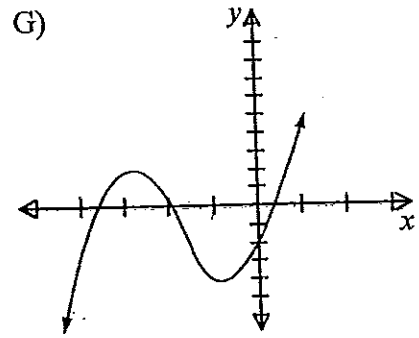
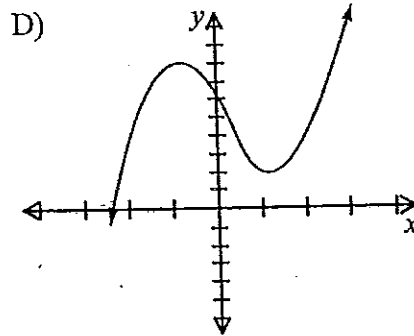
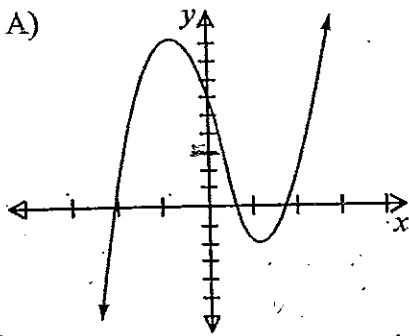
(viii) $y = \frac{1}{3}f(x)$

(iv) $y = f(x-2)$

(ix) $y = -f(x)$

(v) $y = f(x+2) - 3$

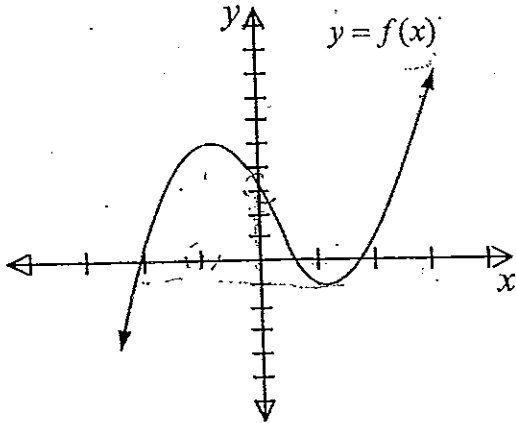
ANSWERS



LOCI

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ANSWERS

