

Understanding Function Notation

This activity requires students to interpret statements.

It is suggested that students copy the three functions onto a large sheet of paper.

Task one is to match a graph to each function and justify for their choice.

Task two is to take the next two sets of cards and match each statement to a graph. Each statement written in function notation has an equivalent statement in words. Students are required to match these with a graph and indicate to which part of the graph they refer.

It is important that all students complete every matching and show understanding by being able to justify their solutions.

An extension task could be to ask students to add more statements and properties to each graph.

This activity is based on three cubic functions, but other types of function could be used.

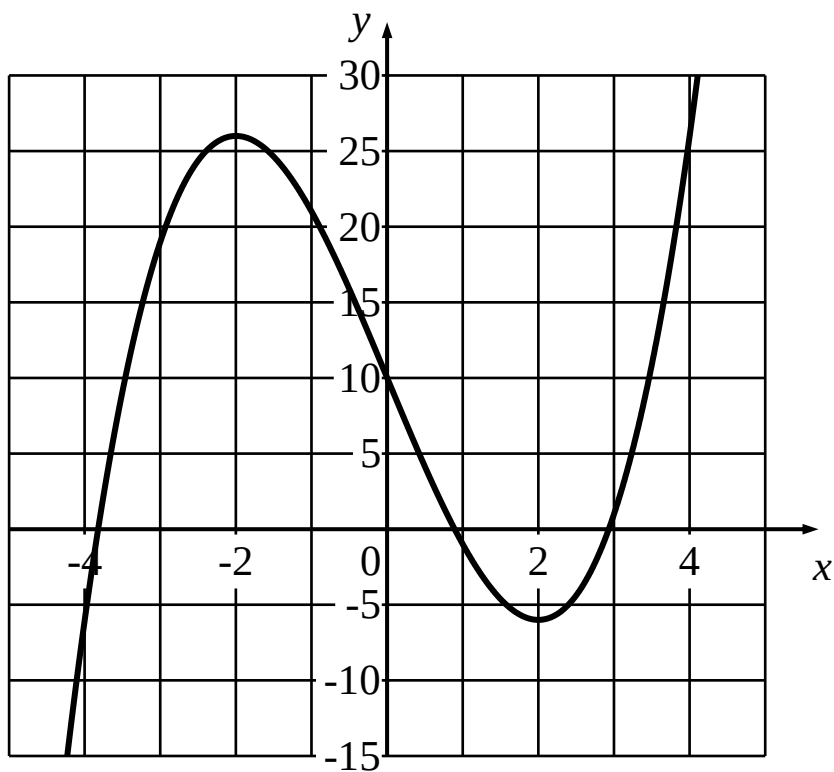
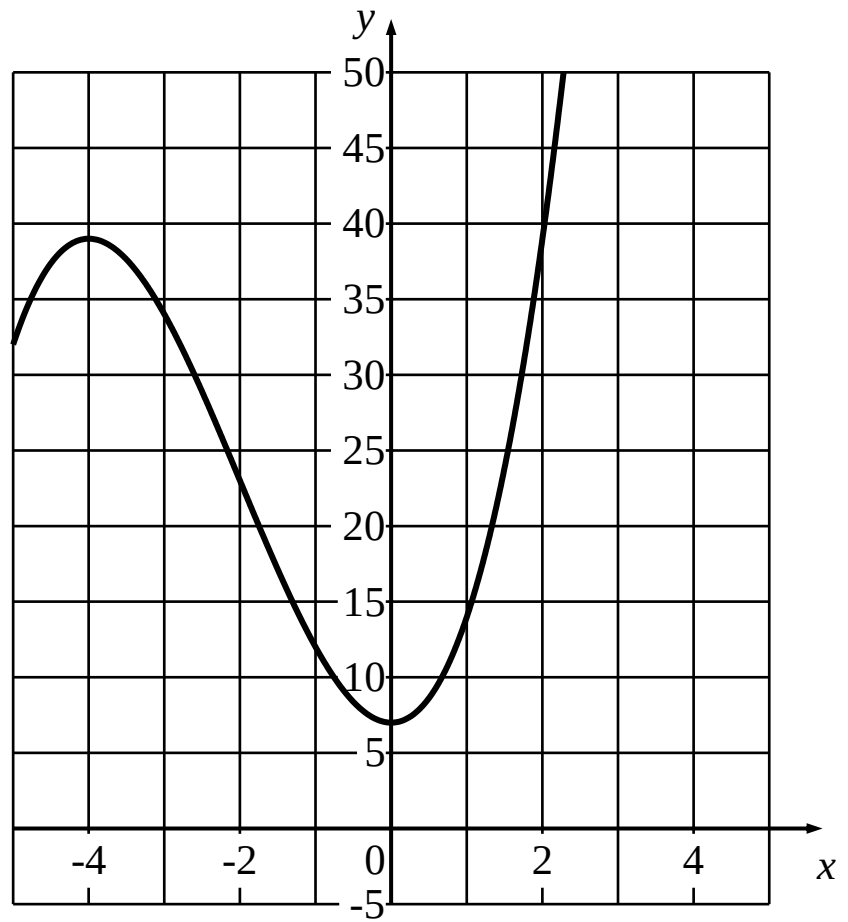
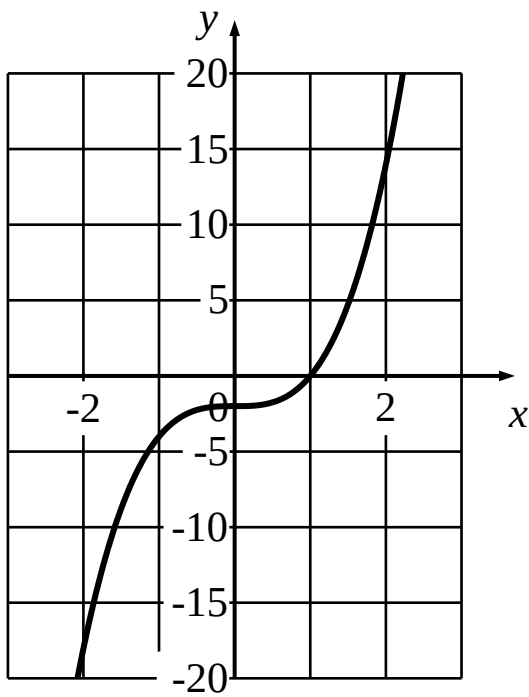
The functions

A	$f(x) = x^3 - 12x + 10$
----------	-------------------------

B	$f(x) = 2x^3 - 2$
----------	-------------------

C	$f(x) = x^3 - 6x^2 + 7$
----------	-------------------------

The Graphs



$f'(x) = 3x^2 - 12x$	$f''(x) = 6x - 12$
$f'(x) = 3x^2 - 12$	$f''(x) = 12x$
$f'(x) = 6x^2$	$f''(x) = 6x$
$f'(1) = 6$	$f(1) = 0$
$f'(2) = 0$	$f(-1) = 0$
$f(3) = -20$	$f'(-2) = 0$
$f''(2) = 12$	$f(0) = 10$
$f'(-1) = 6$	$f''(-2) = -12$
$f(2) = -6$	$f''(2) = 0$
$f'(0) = -12$	$f(-2) = 26$
$f'(3) = -9$	$f(3) = 1$

The graph of $f(x)$ is increasing at $x = -1$
The graph of $f(x)$ is decreasing at $x = 3$
The graph of $f(x)$ crosses the x axis at $x = -1$
The graph of $f(x)$ crosses the y axis at $x = 10$
The graph of $f(x)$ passes through the point $(3, -20)$
At $x = 1$, the graph of $f(x)$ has a gradient of 6

The graph of $f(x)$ crosses the x axis at $x = 1$
The graph of $f(x)$ has a stationary point at $(2, -6)$
The stationary point at $x = -2$ is a maximum.
The graph of $f(x)$ is increasing at $x = 1$.
The stationary point at $x = 2$ is a maximum.
At $x = 3$, the graph of $f(x)$ has a gradient of -9 .