

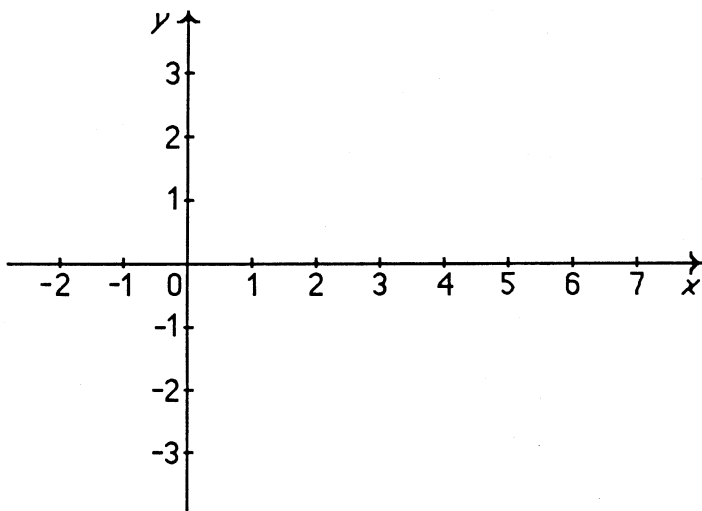
Concepts Worksheet 7

Chapter 3 For use after Article 3.4.

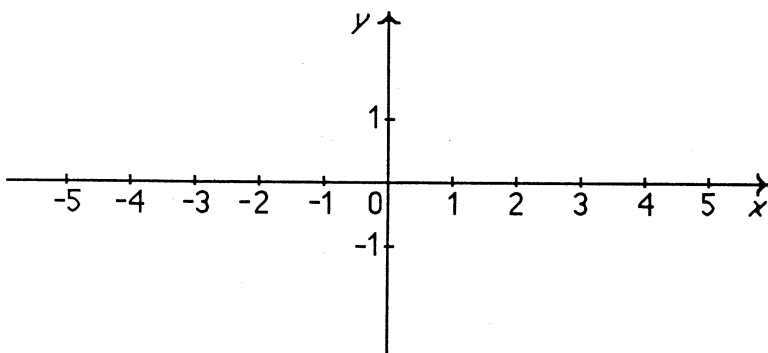
Graph Sketching Using Derivatives

1. Sketch a graph of a differentiable function $f(x)$ over the closed interval $[-2, 7]$, where $f(-2) = f(7) = -3$ and $f(4) = 3$. The roots of $f(x) = 0$ occur at $x = 0$ and $x = 6$, and $f(x)$ has properties indicated in the table below:

x	$-2 < x < 0$	$x = 0$	$0 < x < 2$	$x = 2$	$2 < x < 4$	$x = 4$	$4 < x < 7$
$f'(x)$	positive	0	positive	1	positive	0	negative
$f''(x)$	negative	0	positive	0	negative	0	negative



2. Sketch a graph of the continuous even function $g(x)$ over the closed interval of x values $[-5, 5]$ having a range of $g(x)$ values $[-1, 0]$. For $x \geq 0$, roots of $f(x) = 0$ occur at every whole number k and roots of $g'(x) = 0$ occur at $\frac{k}{2}$. The first and second derivatives of $g(x)$ exist everywhere except at $x = k$. Furthermore, $g''(x) > 0$ for every $x \neq k$.



Concept Connectors

2. Find the x coordinate(s) of any point(s) of discontinuity of f' . _____
3. Find the critical points of f' . _____
4. Sketch f' on the same graph as f . (You will need to approximate the range extent of $f'(x)$ as you graph.)