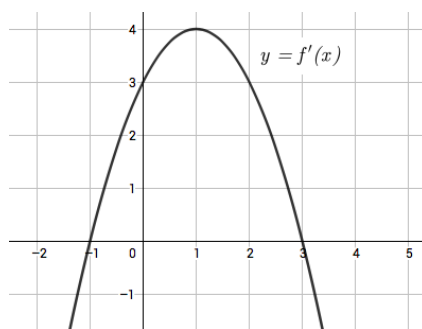


Big 10: Derivative Analysis

Instructions: In the box below are the numbers 0 – 9. Complete the following and cross off the number for each answer. If you complete all problems correctly, you will cross off each number exactly once!

0	1	2	3	4	5	6	7	8	9
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(a) The graph of $f'(x)$ is above. At which x – value does $f(x)$ have a relative maximum?

(b) $g'(x) = x^2 - 8x + 12$. For which of the following x – values is $g(x)$ both decreasing and concave up?

$x = 1$

$x = 3$

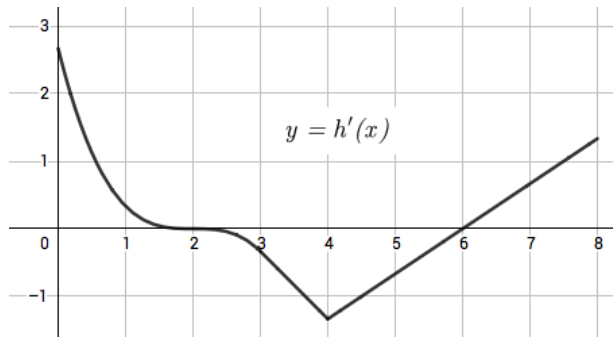
$x = 5$

$x = 7$

$x = 9$

(c) Let $h(x) = 2x^3 + 3x^2 - 12x + 5$. Find the absolute maximum value of $h(x)$ on $[0, 2]$.

(d) If $s(x) = \frac{x}{e^x}$. At which x – value does $s(x)$ have a relative maximum?



Use the graph of $h'(x)$ above to answer questions (e) and (f)

(e) At which x – value does $h(x)$ have a point of inflection?

(f) At which x – value does $h(x)$ have a relative minimum?

(g) Given $f'(x) = x^3(x - 3)^2(x + 1)$, how many relative extrema does $f(x)$ have?

(h) Given $p'(x) = (x + 2)(x - 1)(x - 7)^2$, at which of the following values is $p(x)$ decreasing?

$x = 0$

$x = 2$

$x = 4$

$x = 6$

$x = 8$

(i) $y = \frac{x^3}{6} - 4x^2 + x - 3$. At which x – coordinate does y have a point of inflection?

x	0	3	6	7	9
$g(x)$	-6	-1	-3	2	5
$g'(x)$	5	0	-2	0	3
$g''(x)$	-2	2	3	-1	2

(j) Selected values for g, g' and g'' are given in the table above for the twice differentiable function $g(x)$. At which x – value does $g(x)$ have a relative maximum?