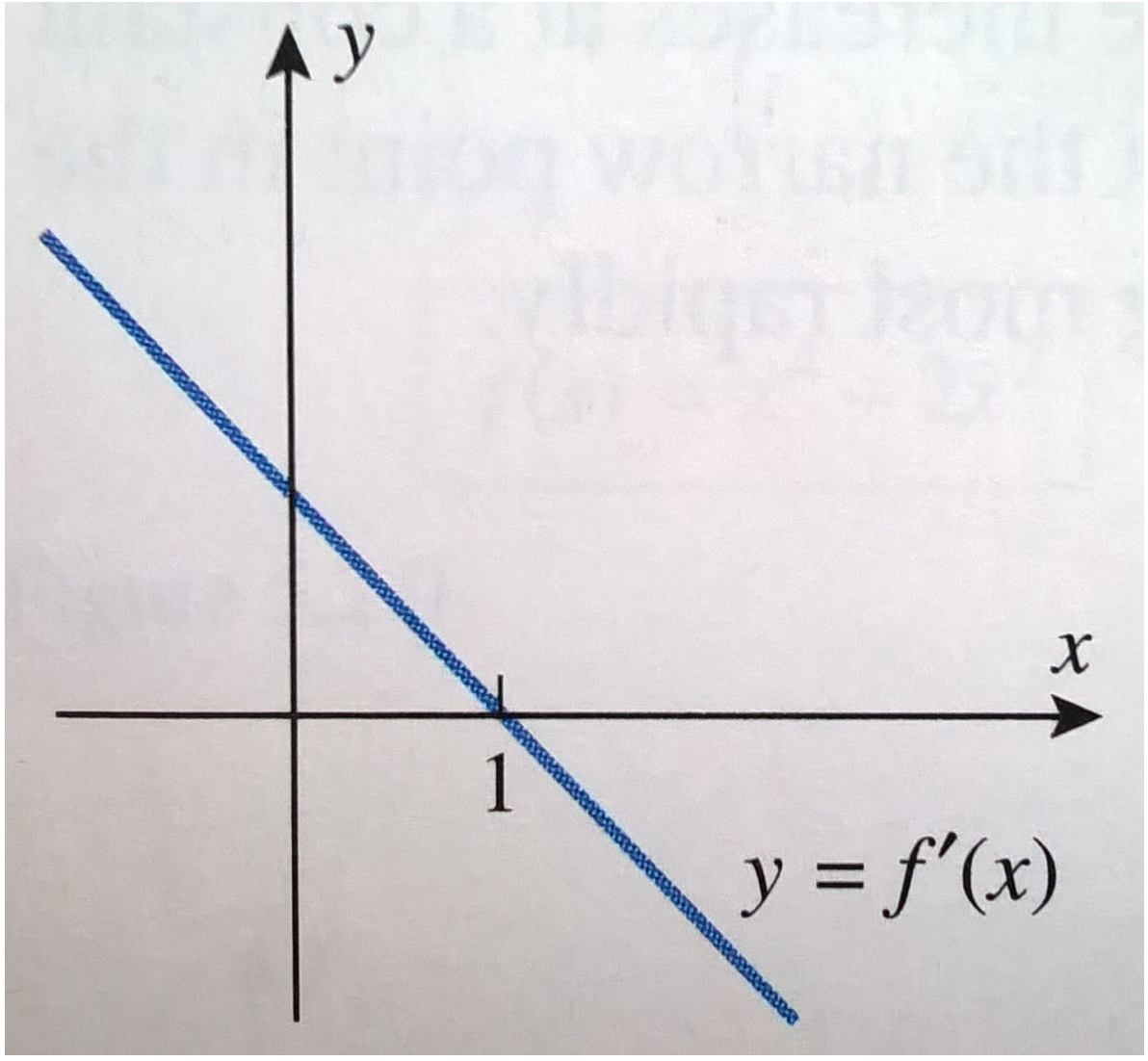
Lesson 21: Graphical Interpretation of Derivatives

March 9, 2020

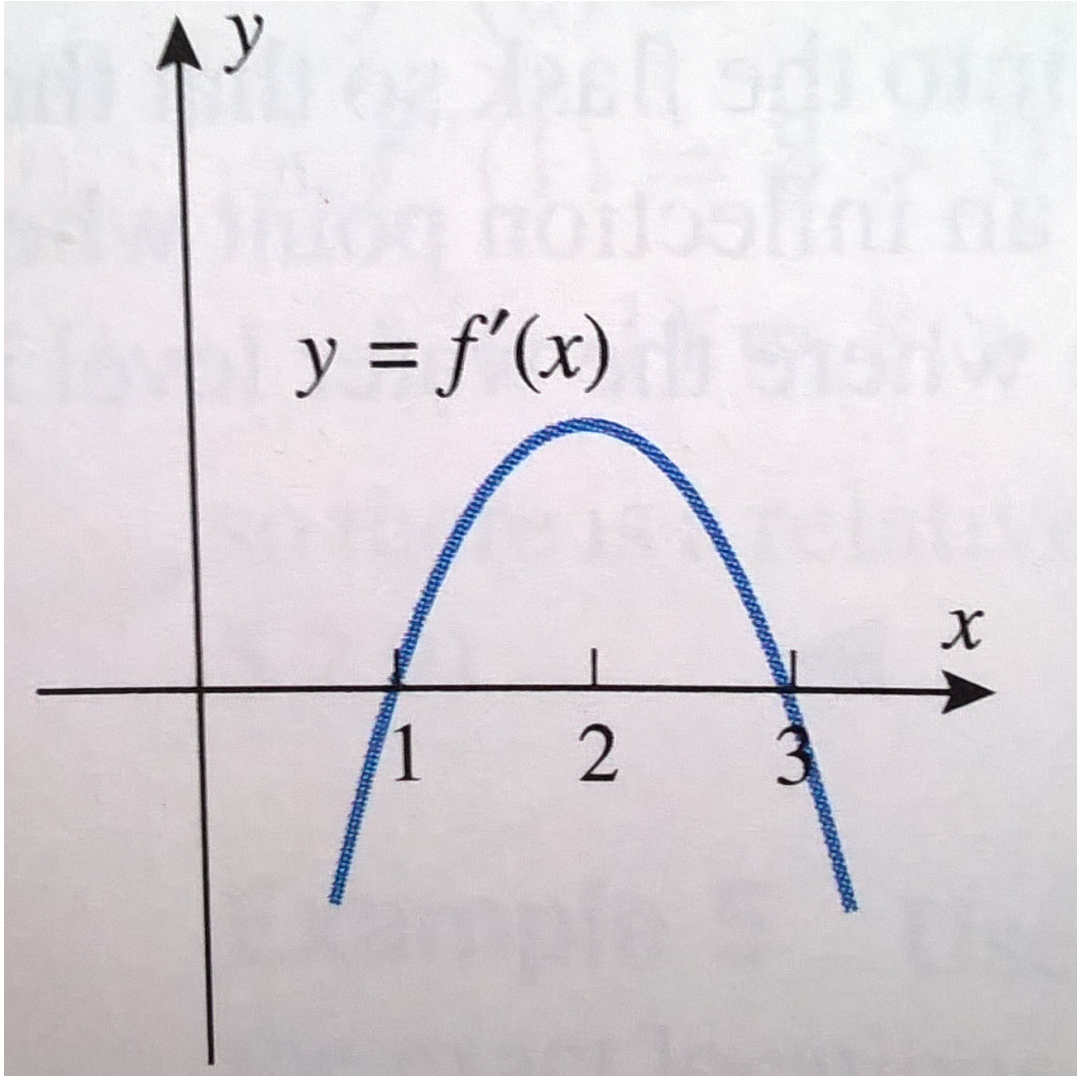
Example 1



Solutions for Example 1:

Critical Numbers of f	$x = 1$
f Increasing	$(-\infty, 1)$
f Decreasing	$(1, \infty)$
Relative Max at	$x = 1$
Relative Min at	NONE
f Concave Up	NONE
f Concave Down	$(-\infty, \infty)$
Inflection Points of f	NONE

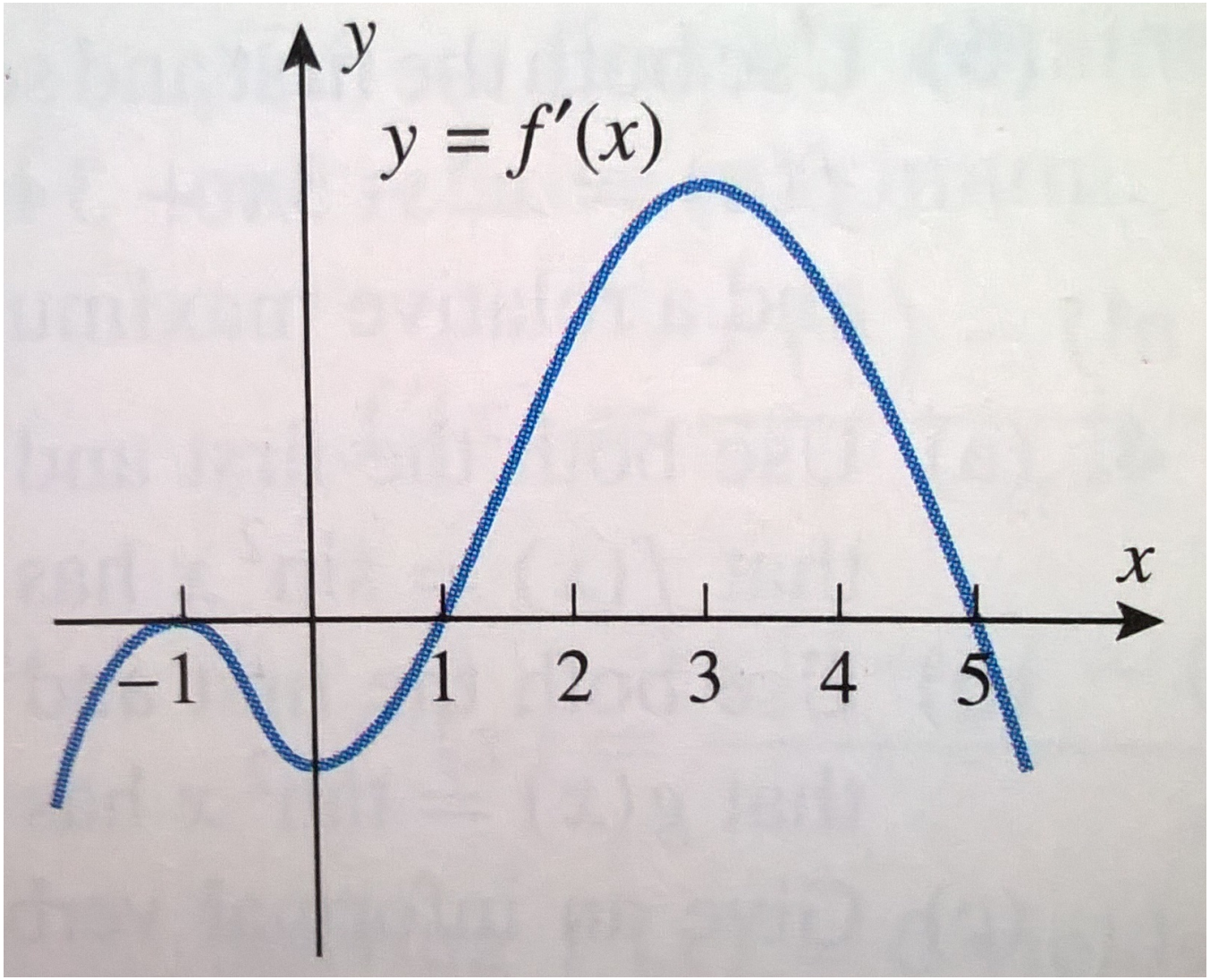
Example 2



Solutions for Example 2:

Critical Numbers of f	$x = 1$ and $x = 3$
f Increasing	$(1, 3)$
f Decreasing	$(-\infty, 1) \cup (3, \infty)$
Relative Max at	$x = 3$
Relative Min at	$x = 1$
f Concave Up	$(-\infty, 2)$
f Concave Down	$(2, \infty)$
Inflection Points of f at	$x = 2$

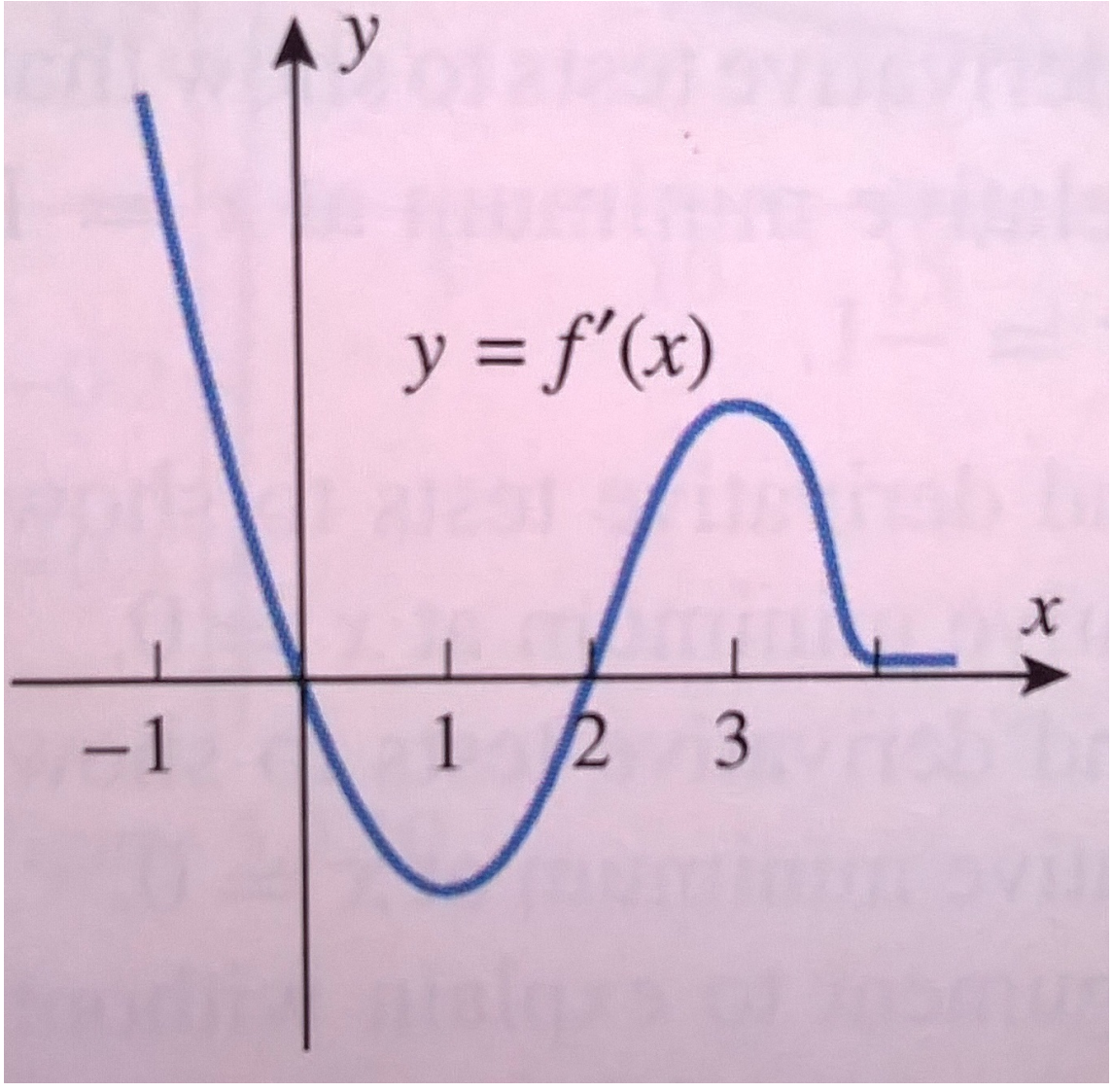
Example 3



Solutions for Example 3:

Critical Numbers of f	$x = -1$ and $x = 1$ and $x = 5$
f Increasing	$(1, 5)$
f Decreasing	$(\infty, 1) \cup (5, \infty)$
Relative Max at	$x = 5$
Relative Min at	$x = 1$
f Concave Up	$(-\infty, -1) \cup (0, 3)$
f Concave Down	$(-1, 0) \cup (3, \infty)$
Inflection Points of f	$x = -1$ and $x = 0$ and $x = 3$

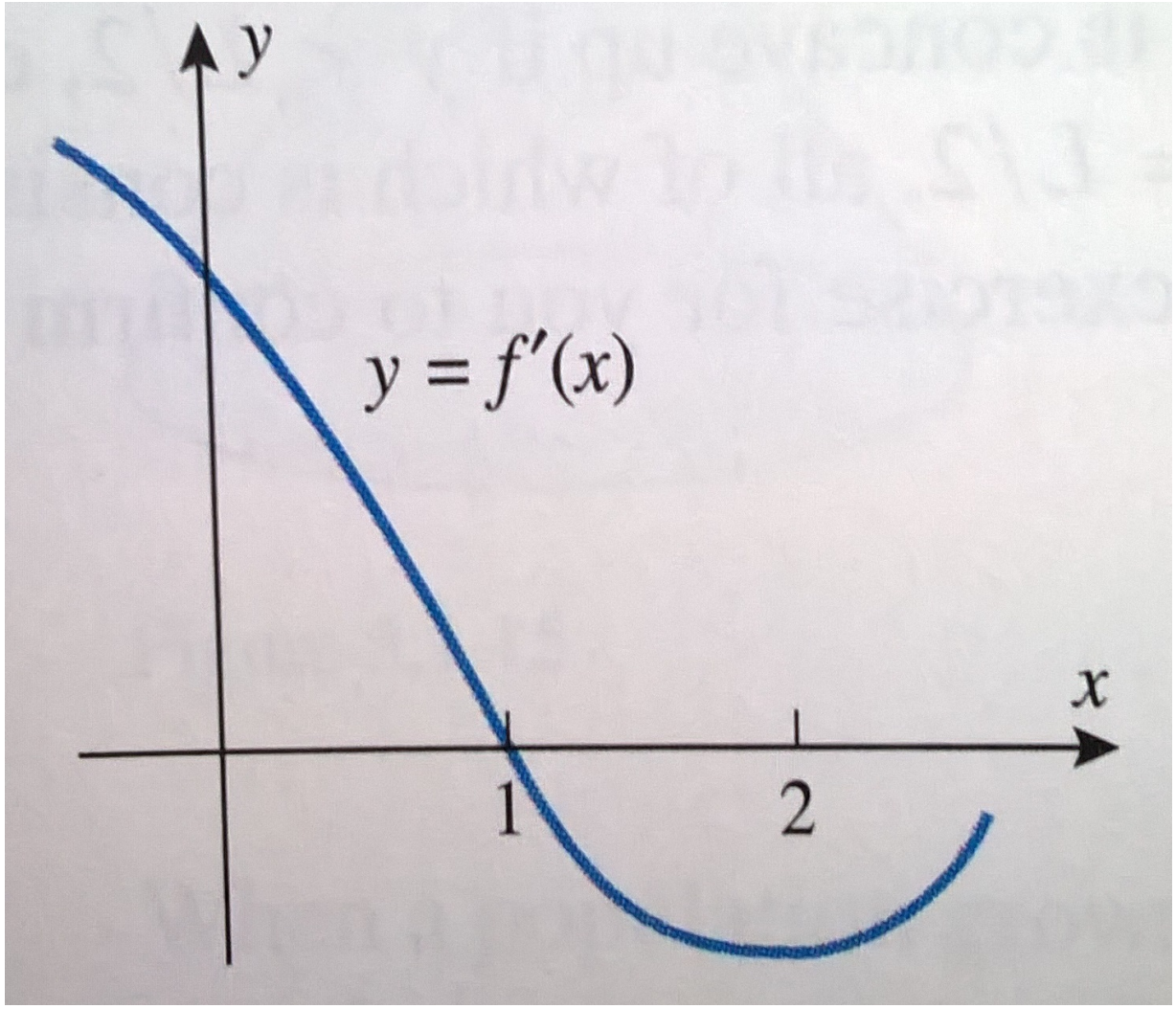
Example 4



Solutions for Example 4:

Critical Numbers of f	$x = 0$ and $x = 2$
f Increasing	$(-\infty, 0) \cup (2, \infty)$
f Decreasing	$(0, 2)$
Relative Max at	$x = 0$
Relative Min at	$x = 2$
f Concave Up	$(1, 3)$
f Concave Down	$(-\infty, 1) \cup (3, \infty)$
Inflection Points of f	$x = 1$ and $x = 3$

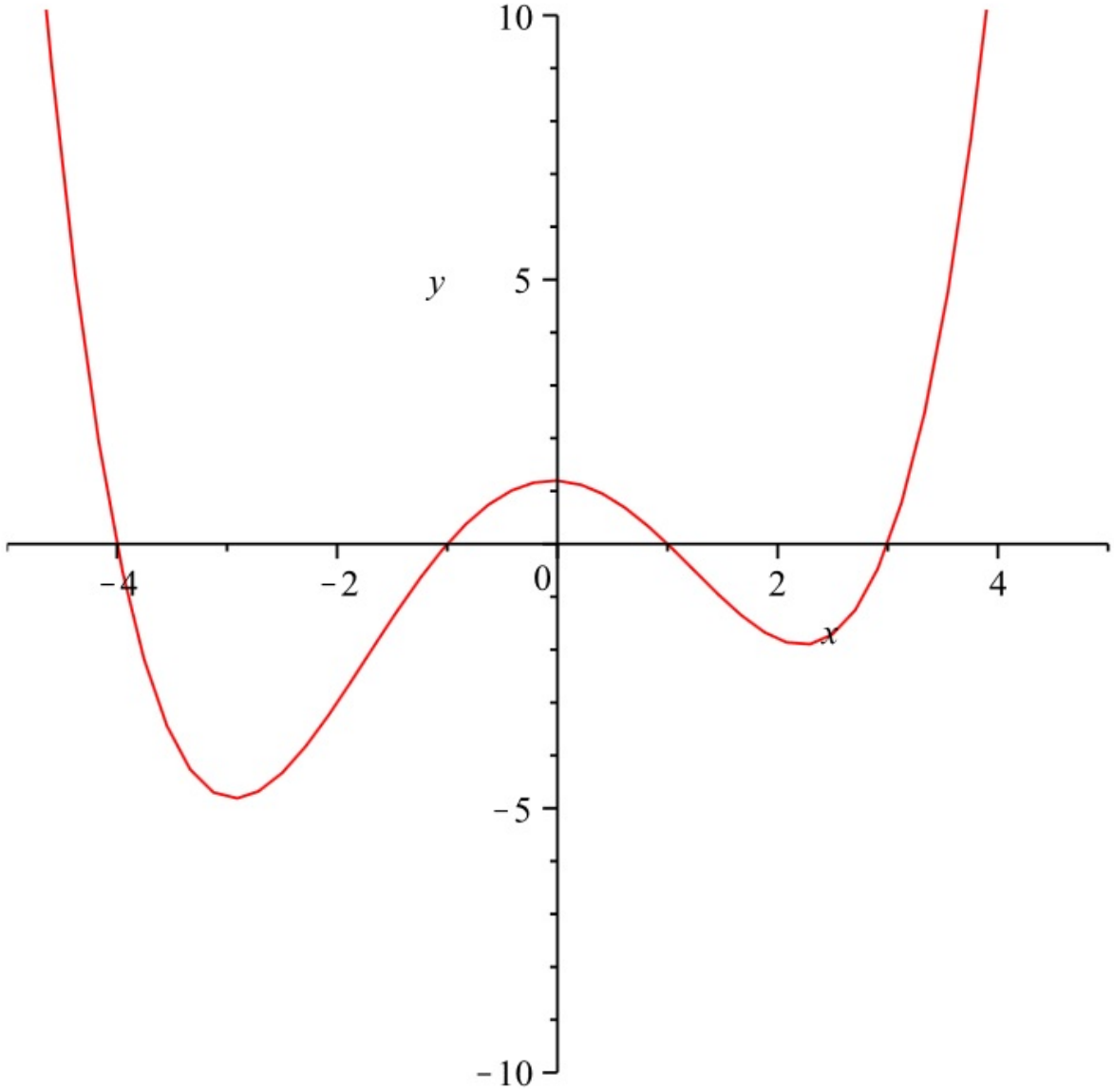
Example 5



Solutions for Example 5:

Critical Numbers of f	$x = 1$
f Increasing	$(-\infty, 1)$
f Decreasing	$(1, 3)$
Relative Max at	$x = 1$
Relative Min at	NONE
f Concave Up	$(2, 3)$
f Concave Down	$(-\infty, 2)$
Inflection Points of f	$x = 2$

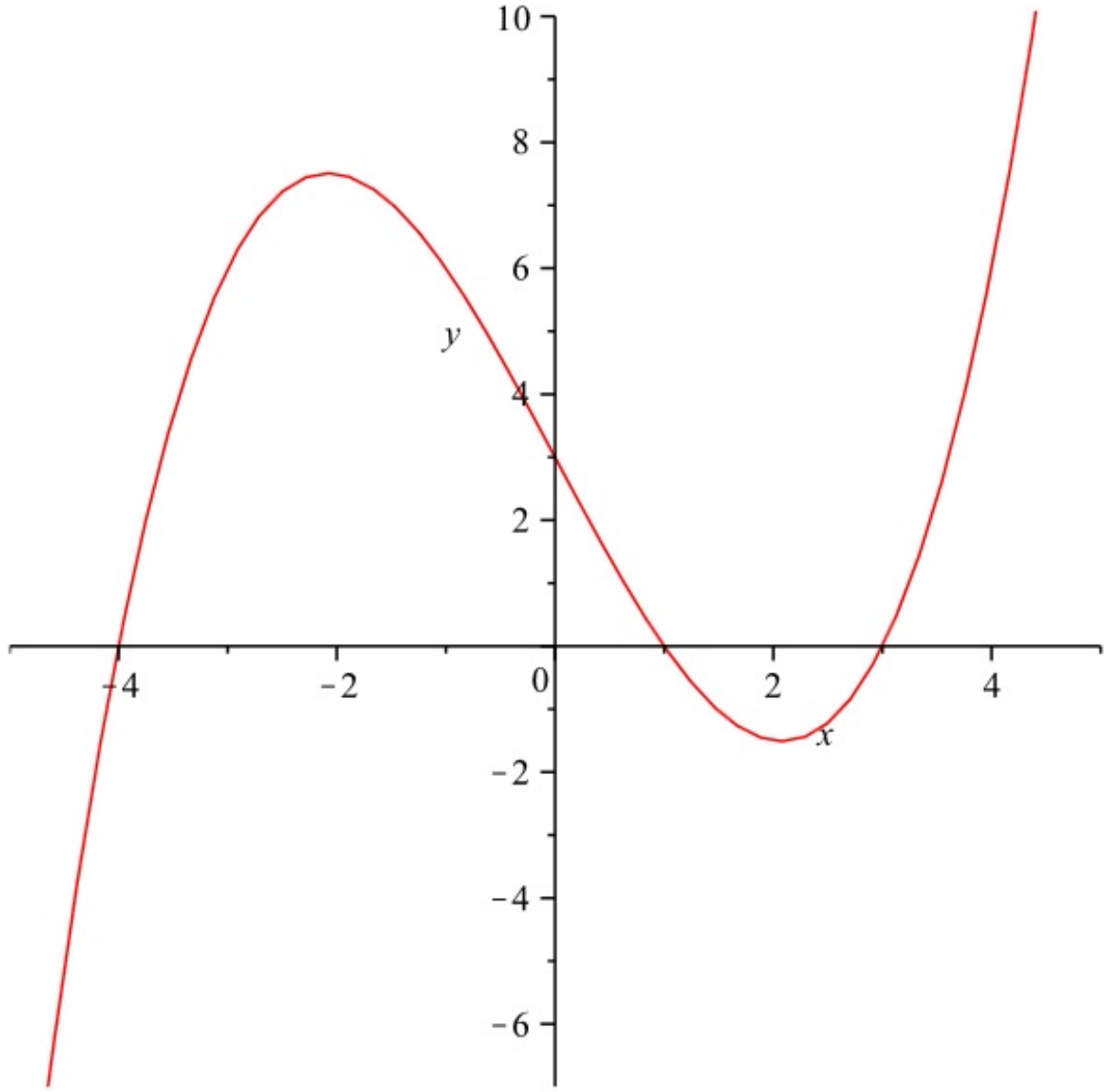
Example 6



Solutions for Example 6:

Critical Numbers of f	$x = -4$ and $x = -1$ and $x = 1$ and $x = 3$
f Increasing	$(-\infty, -4) \cup (-1, 1) \cup (3, \infty)$
f Decreasing	$(-4, -1) \cup (1, 3)$
Relative Max at	$x = -4$ and $x = 1$
Relative Min at	$x = -1$ and $x = 3$
f Concave Up	$(-3, 0) \cup (2, \infty)$
f Concave Down	$(\infty, -3) \cup (0, 2)$
Inflection Points of f	$x = -3$ and $x = 0$ and $x = 2$

Example 7



Solutions for Example 7:

Critical Numbers of f	$x = -4$ and $x = 1$ and $x = 3$
f Increasing	$(-4, 1) \cup (3, \infty)$
f Decreasing	$(-\infty, -4) \cup (1, 3)$
Relative Max at	$x = 1$
Relative Min at	$x = -4$ and $x = 3$
f Concave Up	$(-\infty, -2) \cup (2, \infty)$
f Concave Down	$(-2, 2)$
Inflection Points of f	$x = -2$ and $x = 2$