Chapter 4

The Derivative in Graphing and Applications: การวาดกราฟโดยใช้อนุพันธ์และการประยุกต์

4.1 Graph Sketching
การวาดกราฟ

ข้อ 69

69.1 $x = \pm\sqrt{\frac{3}{5}}, 0$

69.2 $(-\infty, \sqrt{\frac{3}{5}}], [\sqrt{\frac{3}{5}}, \infty)$

69.3 $[-\sqrt{\frac{3}{5}}, \sqrt{\frac{3}{5}}]$

69.4 $x = \pm\sqrt{\frac{3}{10}}, 0$

69.5 $(-\sqrt{\frac{3}{10}}, 0), (\sqrt{\frac{3}{10}}, \infty)$

69.6 $(-\infty, -\sqrt{\frac{3}{10}}), (0, \sqrt{\frac{3}{10}})$

ข้อ 70

70.1 $(-\infty, 0) \cup (0, \infty)$

70.2 $x = 0$

70.3 None.

70.4 $x = \pm 2$

70.5 Increasing on intervals $(-\infty, -2], [2, \infty)$
Decreasing on intervals $[-2, 0), (0, 2]$

70.6 Local maximum at $x = -2$.
Local minimum at $x = 2$.

70.7 Concave up on intervals $(0, \infty)$
Concave down on intervals $(-\infty, 0)$

ข้อ 71

71.1) $(-\infty, -2], [1, \infty)$

71.2) $[-2, 1]$

71.3) $(-\frac{1}{2}, \infty)$

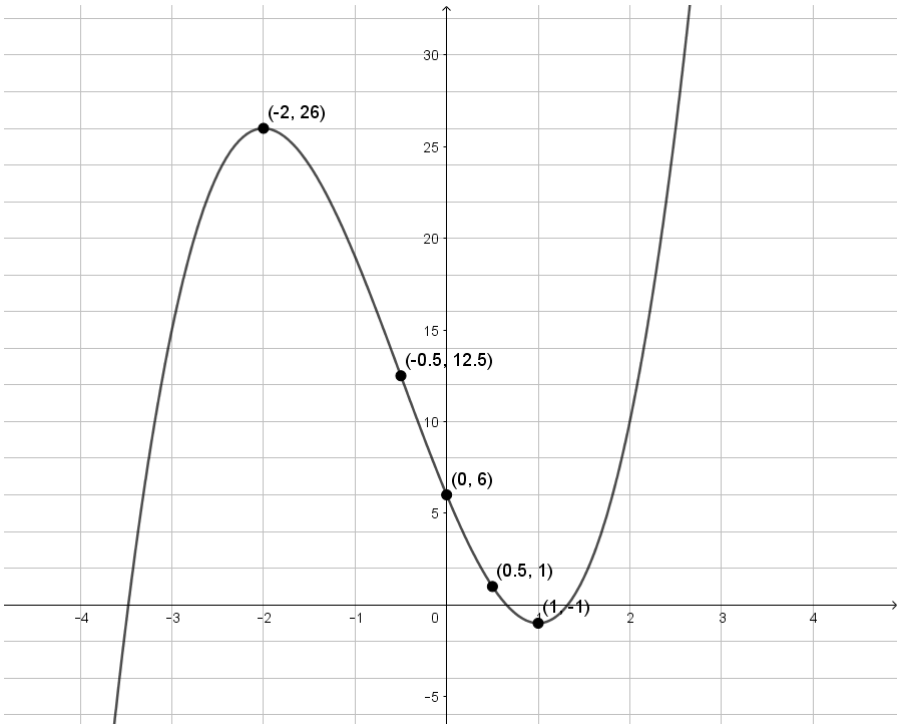
71.4) $(-\infty, -\frac{1}{2})$

71.5) $x = -2$

71.6) $x = 1$

71.7) $x = -\frac{1}{2}$

71.8)



ข้อ 72

72.1 $x = \pm 1, 0$

72.2 Intervals of increase are $(-\infty, -1], [1, \infty)$. Interval of decrease is $[-1, 1]$.

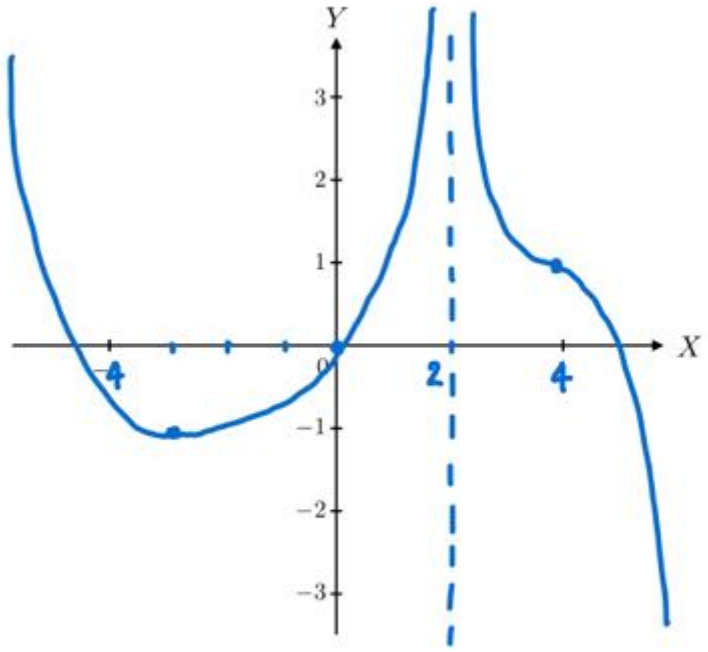
72.3 Concave up intervals are $(-\frac{1}{\sqrt{2}}, 0), (\frac{1}{\sqrt{2}}, \infty)$. Concave downs intervals are $(-\infty, -\frac{}{\sqrt{2}}), (0, \frac{1}{\sqrt{2}})$.

72.4 Relative max at $x = -1$. Relative min at $x = 1$

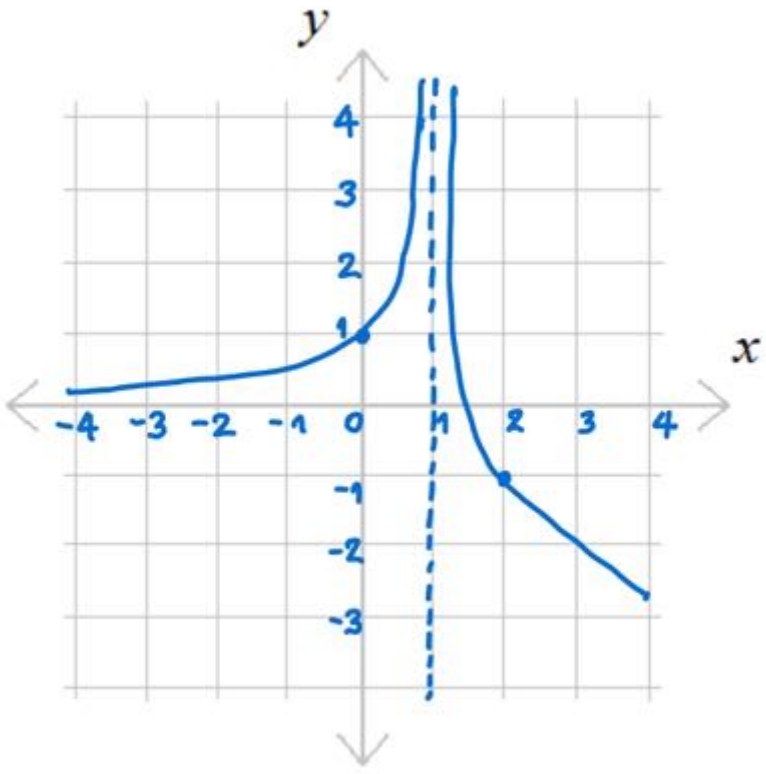
72.5 $x = \pm\frac{1}{2}, 0$

72.6 $x = 3$

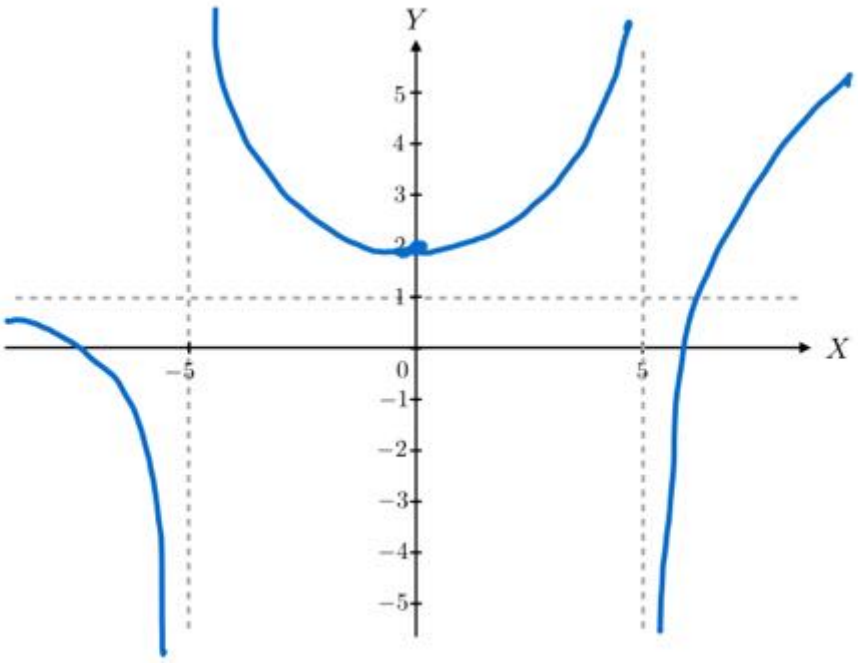
ข้อ 73



ข้อ 74

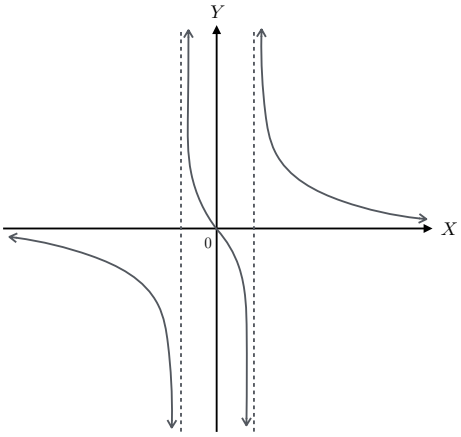


ข้อ 75

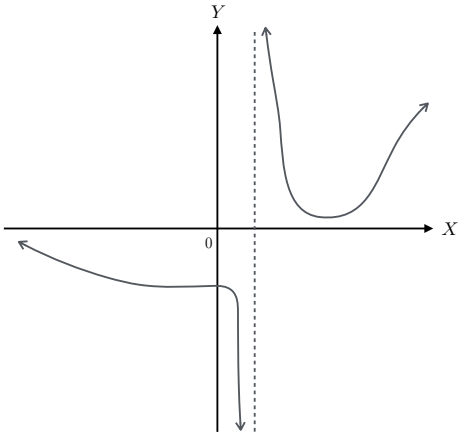


4.2 Relative Extrema
ค่าสุดขีดสัมพัทธ์

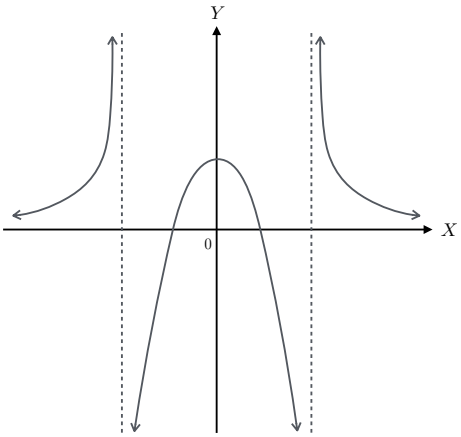
ข้อ 76



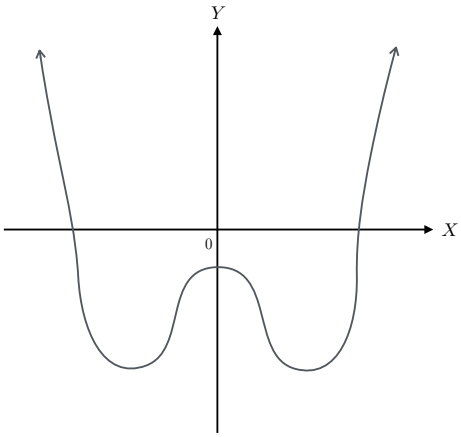
	Yes	No
Relative Minimum exists มีค่าต่ำสุดสัมพัทธ์		✓
Relative Maximum exists มีค่าสูงสุดสัมพัทธ์		✓



	Yes	No
Relative Minimum exists มีค่าต่ำสุดสัมพัทธ์	✓	
Relative Maximum exists มีค่าสูงสุดสัมพัทธ์		✓



	Yes	No
Relative Minimum exists มีค่าต่ำสุดสัมพัทธ์		✓
Relative Maximum exists มีค่าสูงสุดสัมพัทธ์	✓	



	Yes	No
Relative Minimum exists มีค่าต่ำสุดสัมพัทธ์	✓	
Relative Maximum exists มีค่าสูงสุดสัมพัทธ์	✓	

ข้อ 77

77.1) True

77.2) False: an open interval in which $f(1) > f(x_0)$ for all x_0 may not contain 2.

4.3 Absolute Extrema
ค่าสุดขีดสัมบูรณ์

ข้อ 78

78.1 $x = -4$

78.2 $\frac{216}{5}$ (occurs at $x = 4$).

ข้อ 79 The box has minimal surface area when the length of the base is 2 centimeters.

ข้อ 80 Absolute maximum $= 45$ (occurs at $x = -2$). Absolute minimum $= \frac{9}{2}$ (occurs at $x = 1$).

ข้อ 81 Absolute maximum $= 24$ (occurs at $x = 8$). Absolute minimum $= -\frac{2}{3\sqrt{3}}$ (occurs at $x = -\frac{2}{3}$).