MAT 250
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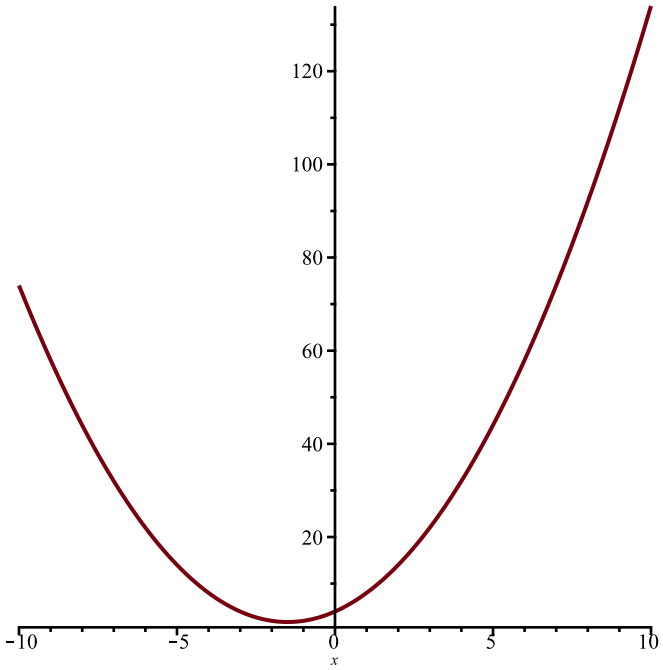
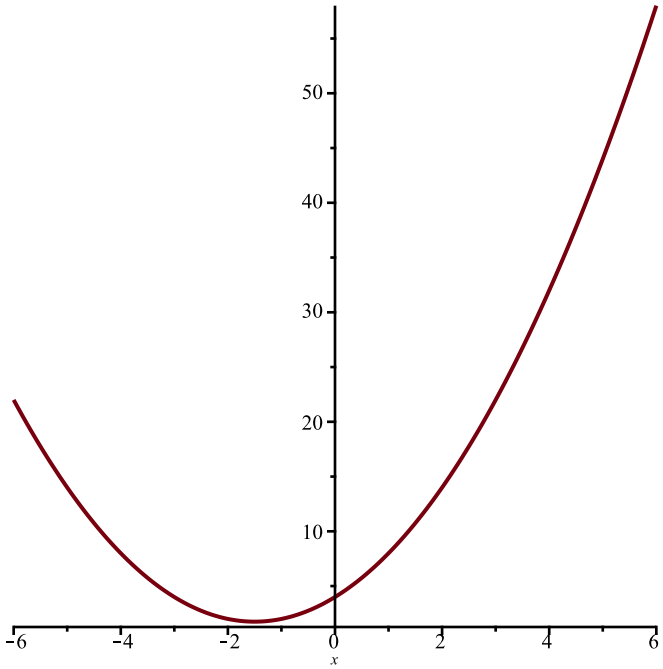
$f(x) := x^2 + 3x + 4$

$$f := x \mapsto x^2 + 3 \cdot x + 4 \quad \textbf{(1)}$$

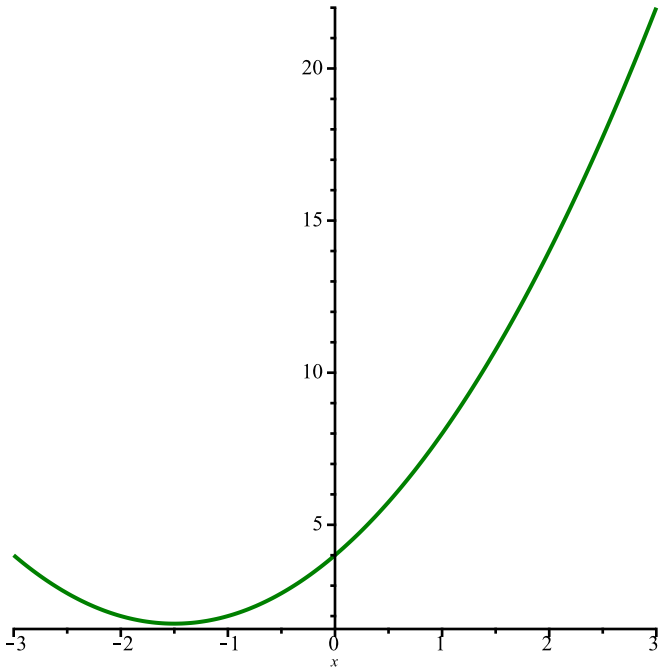
$plot(f(x), x)$



$plot(f(x), x = -6..6)$



$plot(f(x), x = -3..3, color = \text{"Green"})$



$g(x) := 4\,x^3 + 5\,x$

$$g := x \mapsto 4\cdot x^3 + 5\cdot x \tag{2}$$

$diff(g(x), x)$

$$12\,x^2 + 5 \tag{3}$$

$int(g(x), x)$

$$x^4 + \frac{5}{2}\,x^2 \tag{4}$$

$ode := diff(h(x), x, x) = 3\,h(x) + 7$

$$ode := \frac{d^2}{dx^2}\,h(x) = 3\,h(x) + 7 \tag{5}$$

$dsolve(ode)$

$$h(x) = e^{\sqrt{3}\,x}\_C2 + e^{-\sqrt{3}\,x}\_C1 - \frac{7}{3} \tag{6}$$

$ics := h(0) = 1, D(h)(0) = 0$

$$ics := h(0) = 1, D(h)(0) = 0 \tag{7}$$

$dsolve(\{ics, ode\})$

$$h(x) = \frac{5\,e^{\sqrt{3}\,x}}{3} + \frac{5\,e^{-\sqrt{3}\,x}}{3} - \frac{7}{3} \tag{8}$$

$solve(f(x), x)$

$$-\frac{3}{2} + \frac{I\sqrt{7}}{2}, -\frac{3}{2} - \frac{I\sqrt{7}}{2} \tag{9}$$