

1. $f(x) = \left(\frac{1}{3}\right)^{x-2}$

domain: $(-\infty, \infty)$

range: $(0, \infty)$

vertical asymptote: *none*

horizontal asymptote: $y = 0$

x-intercept: *none*

y-intercept: $(0, 9)$

relative maximum: *none*

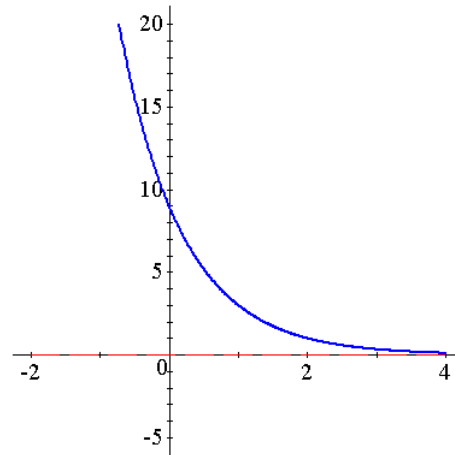
relative minimum: *none*

increasing interval: *none*

decreasing interval: $(-\infty, \infty)$

left end-behavior: $x \rightarrow -\infty, f(x) \rightarrow \infty$

right end-behavior: $x \rightarrow \infty, f(x) \rightarrow 0$



2. $f(x) = \frac{4x^2 - 1}{1 - x^2}$

domain: $(-\infty, -1) \cup (-1, 1) \cup (1, \infty)$

range: $(-\infty, -4) \cup [-1, \infty)$

vertical asymptote: $x = -1, x = 1$

horizontal asymptote: $y = -4$

x-intercept: $(-1/2, 0), (1/2, 0)$

y-intercept: $(0, -1)$

relative maximum: *none*

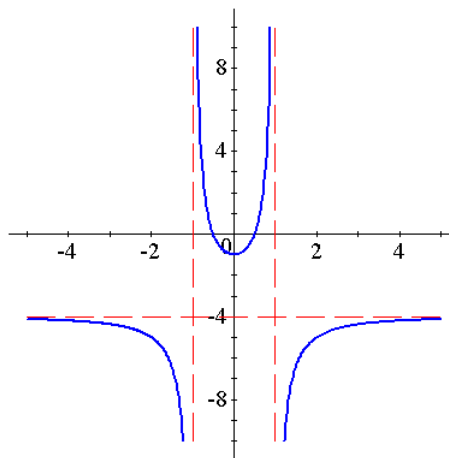
relative minimum: $(0, -1)$

increasing interval: $(0, 1) \cup (1, \infty)$

decreasing interval: $(-\infty, -1) \cup (-1, 0)$

left end-behavior: $x \rightarrow -\infty, f(x) \rightarrow -4$

right end-behavior: $x \rightarrow \infty, f(x) \rightarrow -4$



3. $f(x) = \frac{1}{2} \ln x + 3$

domain: $(0, \infty)$

range: $(-\infty, \infty)$

vertical asymptote: $x = 0$

horizontal asymptote: *none*

x-intercept: $(0.002, 0)$ or $(e^{-6}, 0)$

y-intercept: *none*

relative maximum: *none*

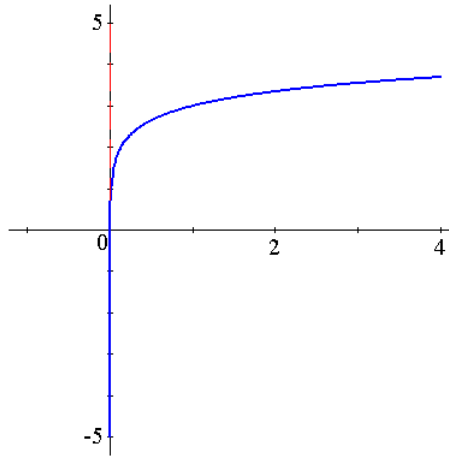
relative minimum: *none*

increasing interval: $(0, \infty)$

decreasing interval: *none*

left end-behavior: *none*

right end-behavior: $x \rightarrow \infty, f(x) \rightarrow \infty$



4. $f(x) = \frac{x^3 + 4}{x^2}$

domain: $(-\infty, 0) \cup (0, \infty)$

range: $(-\infty, \infty)$

vertical asymptote: $x = 0$

horizontal asymptote: *none*

x-intercept: $(-1.587, 0)$ or $(-2^{2/3}, 0)$

y-intercept: *none*

relative maximum: *none*

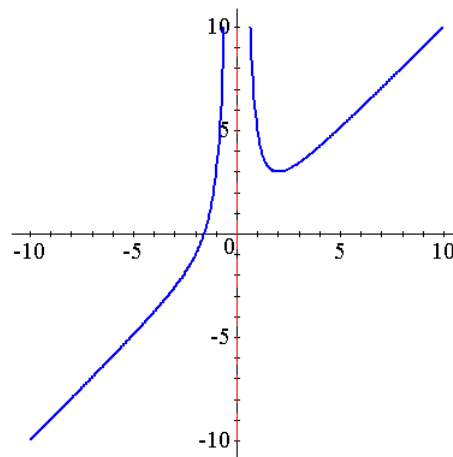
relative minimum: $(2, 3)$

increasing interval: $(-\infty, 0) \cup (2, \infty)$

decreasing interval: $(0, 2)$

left end-behavior: $x \rightarrow -\infty, f(x) \rightarrow -\infty$

right end-behavior: $x \rightarrow \infty, f(x) \rightarrow \infty$



5. $f(x) = 5 - e^x$

domain: $(-\infty, \infty)$

range: $(-\infty, 5)$

vertical asymptote: *none*

horizontal asymptote: $y = 5$

x-intercept: $(1.609, 0)$ or $(\ln 5, 0)$

y-intercept: $(0, 4)$

relative maximum: *none*

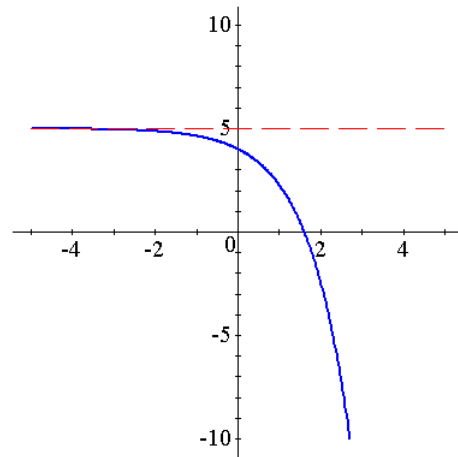
relative minimum: *none*

increasing interval: *none*

decreasing interval: $(-\infty, \infty)$

left end-behavior: $x \rightarrow -\infty, f(x) \rightarrow 5$

right end-behavior: $x \rightarrow \infty, f(x) \rightarrow -\infty$



6. $f(x) = \log_2(x - 3)$

domain: $(3, \infty)$

range: $(-\infty, \infty)$

vertical asymptote: $x = 3$

horizontal asymptote: *none*

x-intercept: $(4, 0)$

y-intercept: *none*

relative maximum: *none*

relative minimum: *none*

increasing interval: $(3, \infty)$

decreasing interval: *none*

left end-behavior: *none*

right end-behavior: $x \rightarrow \infty, f(x) \rightarrow \infty$

