

1. $(-\infty, -3]$: decreasing; $[-3, 0]$: increasing; $[0, +\infty)$: increasing.
 $(-\infty, -2]$: concave up; $[-2, 0]$: concave down; $[0, +\infty)$: concave up.

2. 10 meters by 15 meters.

3. Domain: $x \neq \pm 1$.

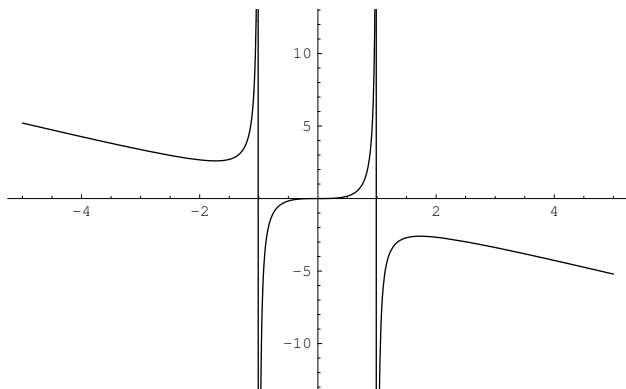
x -intercept: $y = 0$; y -intercept: $x = 0$.

Symmetric with respect to the origin.

Vertical asymptotes: $x = \pm 1$; slanted asymptote: $y = -x$.

Local minimum $f(-\sqrt{3}) = 3\sqrt{3}/2 \approx 2.60$; local maximum $f(\sqrt{3}) = -3\sqrt{3}/2 \approx -2.60$.

Inflection point $(0, f(0)) = (0, 0)$.



4. 18.

$$5. \frac{1}{\tan x} \cdot \sec^2 x - \frac{1}{x^4 + 1} \cdot 4x^3.$$

$$6. \left[\frac{(3)^6}{6} + 4(3)^2 \right] - \left[\frac{(-2)^6}{6} + 4(-2)^2 \right].$$

$$2[(1)^{5/2} + (1)^{3/2}] - 2[(4)^{5/2} + (4)^{3/2}].$$

$$7. \frac{1}{-5} \left[\frac{8}{9} (3 - 5x)^{9/8} \right] + C.$$

$$\frac{1}{4} \left[\frac{1}{6} (x^4 + 2)^6 \right] + C.$$

$$\frac{1}{-2} [\sin(3 - 2x)] + C.$$

$$\frac{1}{-1} \left[\frac{1}{7} (1 + \cos x)^7 \right] + C.$$

$$\frac{1}{2} [-\csc(x^2)] + C.$$