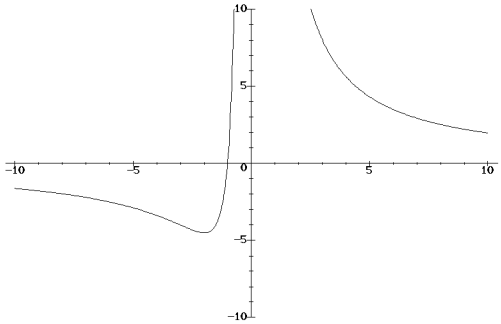
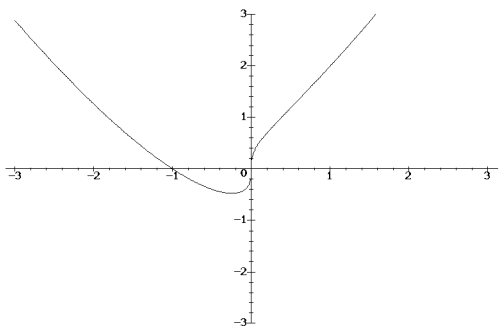
Answers to **Curve Sketching**: 21–28.

21.



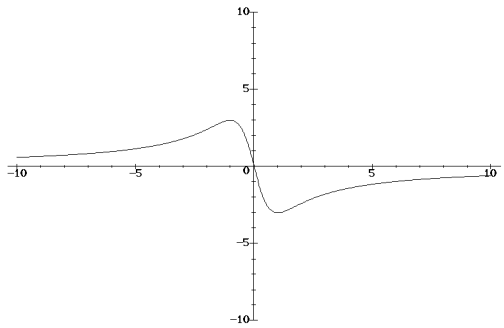
x-intercepts	$(-1, 0)$
y-intercept	none
H.A.	$y = 0$
V.A.	$x = 0$
Increasing on	$(-2, 0)$
Decreasing on	$(-\infty, -2), (0, \infty)$
Concave up on	$(-3, 0), (0, \infty)$
Concave down on	$(-\infty, -3)$
Rel. Max. at	none
Rel. Min. at	$(-2, -\frac{9}{2})$
Inflection pt. at	$(-3, -4)$

22.



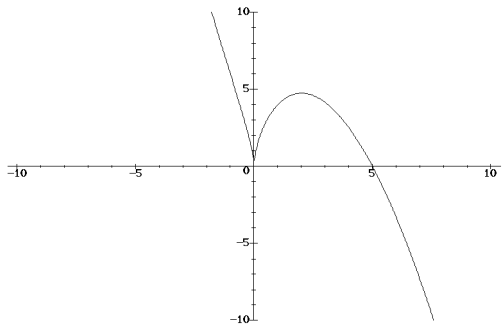
x-intercepts	$(0, 0); (-1, 0)$
y-intercept	$(0, 0)$
H.A.	none
V.A.	none
Increasing on	$(-\frac{1}{4}, \infty)$
Decreasing on	$(-\infty, -\frac{1}{4})$
Concave up on	$(-\infty, 0), (\frac{1}{2}, \infty)$
Concave down on	$(0, \frac{1}{2})$
Rel. Max. at	none
Rel. Min. at	$(-\frac{1}{4}, -\frac{3}{\sqrt[3]{256}})$
Inflection pt. at	$(0, 0); (\frac{1}{2}, \frac{3}{\sqrt[3]{16}})$

23.



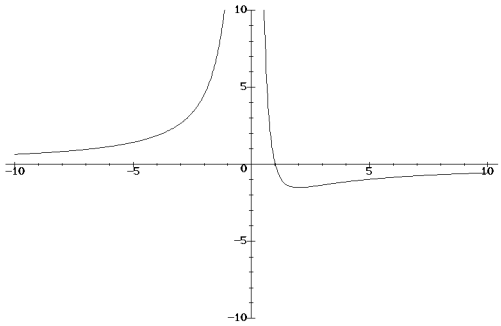
x-intercepts	$(0, 0)$
y-intercept	$(0, 0)$
H.A.	$y = 0$
V.A.	none
Increasing on	$(-\infty, -1), (1, \infty)$
Decreasing on	$(-1, 1)$
Concave up on	$(-\infty, -\sqrt{3}), (0, \sqrt{3})$
Concave down on	$(-\sqrt{3}, 0), (\sqrt{3}, \infty)$
Rel. Max. at	$(-1, 3)$
Rel. Min. at	$(1, -3)$
Inflection pt. at	$(0, 0); (-\sqrt{3}, \frac{3\sqrt{3}}{2}); (\sqrt{3}, -\frac{3\sqrt{3}}{2})$

24.



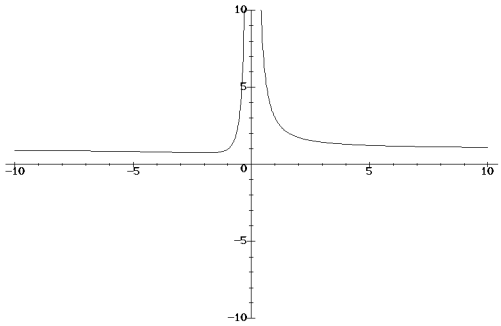
x-intercepts	$(0, 0); (5, 0)$
y-intercept	$(0, 0)$
H.A.	none
V.A.	none
Increasing on	$(0, 2)$
Decreasing on	$(-\infty, 0), (2, \infty)$
Concave up on	$(-\infty, -1)$
Concave down on	$(-1, 0), (0, \infty)$
Rel. Max. at	$(2, 3\sqrt[3]{4})$
Rel. Min. at	$(0, 0)$
Inflection pt. at	$(-1, 6)$

25.



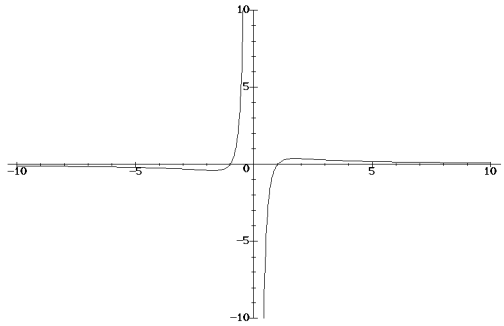
x-intercepts	$(1, 0)$
y-intercept	none
H.A.	$y = 0$
V.A.	$x = 0$
Increasing on	$(-\infty, 0), (2, \infty)$
Decreasing on	$(0, 2)$
Concave up on	$(-\infty, 0), (0, 3)$
Concave down on	$(3, \infty)$
Rel. Max. at	none
Rel. Min. at	$(2, -\frac{3}{2})$
Inflection pt. at	$(3, -\frac{4}{3})$

26.



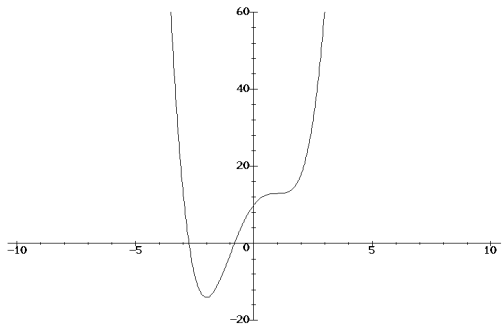
x-intercepts	none
y-intercept	none
H.A.	$y = 1$
V.A.	$x = 0$
Increasing on	$(-2, 0)$
Decreasing on	$(-\infty, -2), (0, \infty)$
Concave up on	$(-3, 0), (0, \infty)$
Concave down on	$(-\infty, -3)$
Rel. Max. at	none
Rel. Min. at	$(-2, \frac{3}{4})$
Inflection pt. at	$(-3, \frac{7}{9})$

27.



x-intercepts	$(\pm 1, 0)$
y-intercept	none
H.A.	$y = 0$
V.A.	$x = 0$
Increasing on	$(-\sqrt{3}, 0), (0, \sqrt{3})$
Decreasing on	$(-\infty, -\sqrt{3}), (\sqrt{3}, \infty)$
Concave up on	$(-\sqrt{6}, 0), ((\sqrt{6}, \infty)$
Concave down on	$(-\infty, -\sqrt{6}), (0, \sqrt{6})$
Rel. Max. at	$(\sqrt{3}, \frac{2}{3\sqrt{3}})$
Rel. Min. at	$(-\sqrt{3}, -\frac{2}{3\sqrt{3}})$
Inflection pt. at	$(-\sqrt{6}, -\frac{5}{6\sqrt{6}}); (\sqrt{6}, \frac{5}{6\sqrt{6}})$

28.



x-intercepts	irrational
y-intercept	$(0, 10)$
H.A.	none
V.A.	none
Increasing on	$(-2, \infty)$
Decreasing on	$(-\infty, -2)$
Concave up on	$(-\infty, -1), (1, \infty)$
Concave down on	$(-1, 1)$
Rel. Max. at	none
Rel. Min. at	$(-2, -14)$
Inflection pt. at	$(-1, -3); (1, 13)$