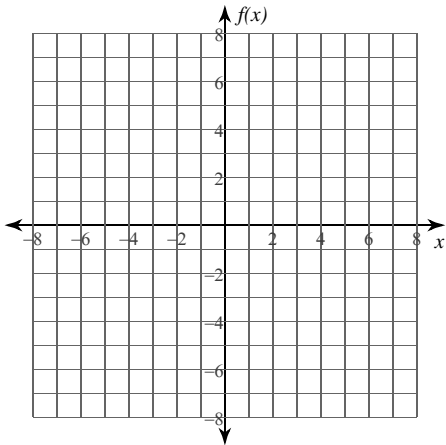


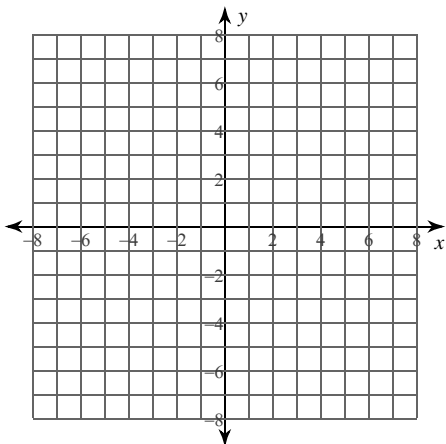
Calculus Practice: Curve Sketching 2

For each problem, find the: x and y intercepts, asymptotes, x-coordinates of the critical points, open intervals where the function is increasing and decreasing, x-coordinates of the inflection points, open intervals where the function is concave up and concave down, and relative minima and maxima. Using this information, sketch the graph of the function.

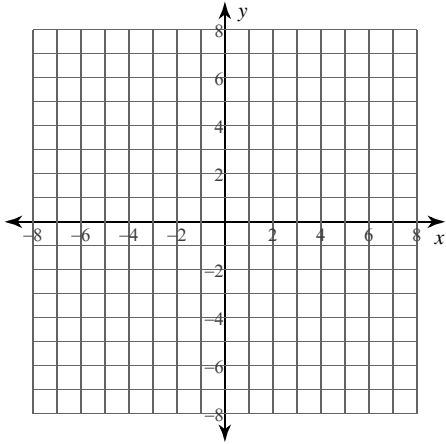
1) $f(x) = -\frac{x^3}{3} - x^2$



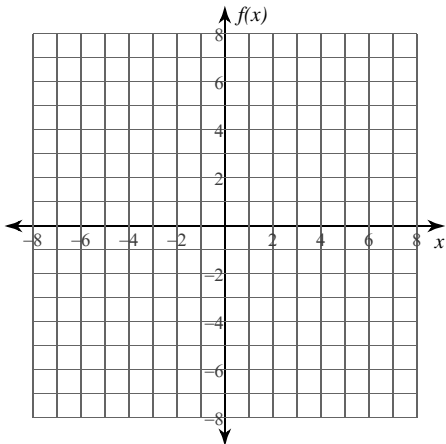
2) $y = \frac{x^3}{3} - \frac{2x^2}{3} + \frac{x}{3}$



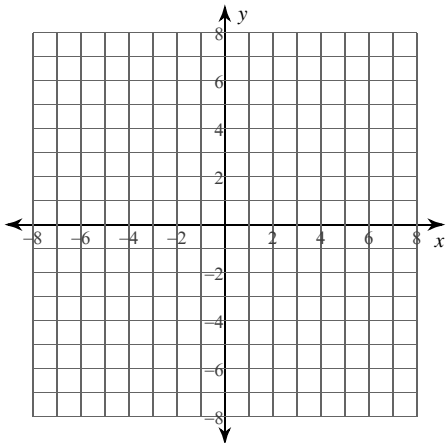
$$3) y = -\frac{x^3}{3} - \frac{2x^2}{3} - \frac{x}{3}$$



$$4) f(x) = \frac{x^3}{6} - \frac{x^2}{3} + \frac{x}{6}$$



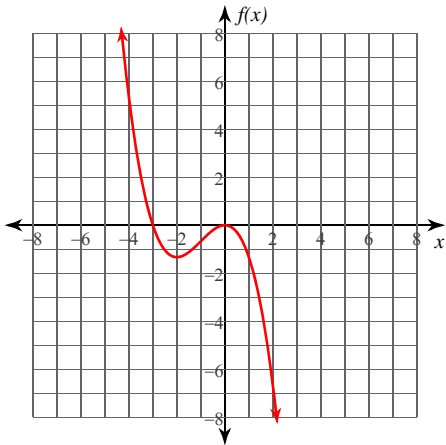
$$5) y = 2x^3 + 4x^2$$



Calculus Practice: Curve Sketching 2

For each problem, find the: x and y intercepts, asymptotes, x -coordinates of the critical points, open intervals where the function is increasing and decreasing, x -coordinates of the inflection points, open intervals where the function is concave up and concave down, and relative minima and maxima. Using this information, sketch the graph of the function.

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



x -intercepts at $x = -3, 0$ y -intercept at $y = 0$

No vertical asymptotes exist.

No horizontal asymptotes exist.

Critical points at: $x = -2, 0$

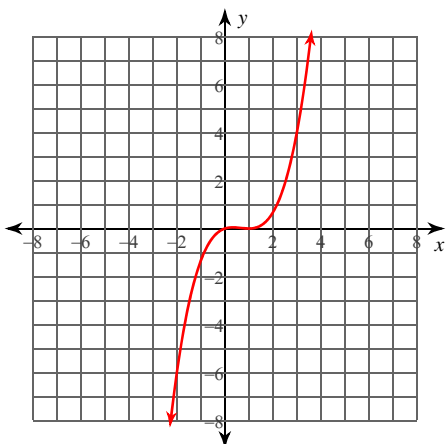
Increasing: $(-2, 0)$ Decreasing: $(-\infty, -2), (0, \infty)$

Inflection point at: $x = -1$

Concave up: $(-\infty, -1)$ Concave down: $(-1, \infty)$

Relative minimum: $(-2, -\frac{4}{3})$ Relative maximum: $(0, 0)$

2) $y = \frac{x^3}{3} - \frac{2x^2}{3} + \frac{x}{3}$



x -intercepts at $x = 0, 1$ y -intercept at $y = 0$

No vertical asymptotes exist.

No horizontal asymptotes exist.

Critical points at: $x = \frac{1}{3}, 1$

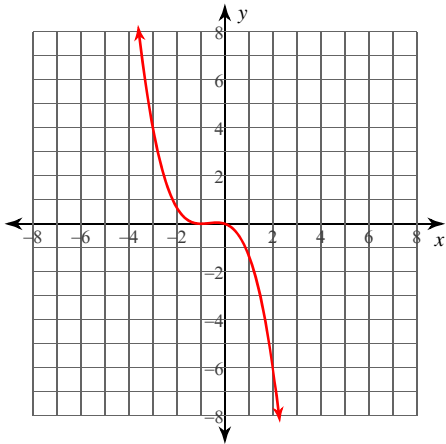
Increasing: $(-\infty, \frac{1}{3}), (1, \infty)$ Decreasing: $(\frac{1}{3}, 1)$

Inflection point at: $x = \frac{2}{3}$

Concave up: $(\frac{2}{3}, \infty)$ Concave down: $(-\infty, \frac{2}{3})$

Relative minimum: $(1, 0)$ Relative maximum: $(\frac{1}{3}, \frac{4}{81})$

$$3) y = -\frac{x^3}{3} - \frac{2x^2}{3} - \frac{x}{3}$$



x-intercepts at $x = -1, 0$ y-intercept at $y = 0$

No vertical asymptotes exist.

No horizontal asymptotes exist.

Critical points at: $x = -1, -\frac{1}{3}$

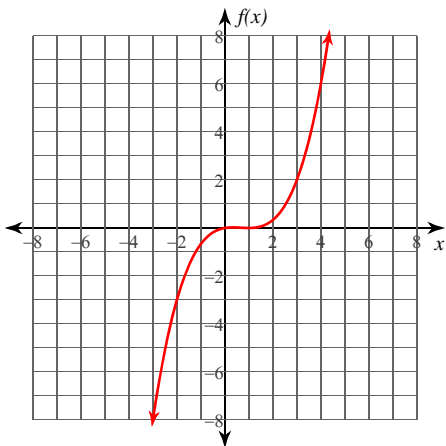
Increasing: $(-1, -\frac{1}{3})$ Decreasing: $(-\infty, -1), (-\frac{1}{3}, \infty)$

Inflection point at: $x = -\frac{2}{3}$

Concave up: $(-\infty, -\frac{2}{3})$ Concave down: $(-\frac{2}{3}, \infty)$

Relative minimum: $(-1, 0)$ Relative maximum: $(-\frac{1}{3}, \frac{4}{81})$

$$4) f(x) = \frac{x^3}{6} - \frac{x^2}{3} + \frac{x}{6}$$



x-intercepts at $x = 0, 1$ y-intercept at $y = 0$

No vertical asymptotes exist.

No horizontal asymptotes exist.

Critical points at: $x = \frac{1}{3}, 1$

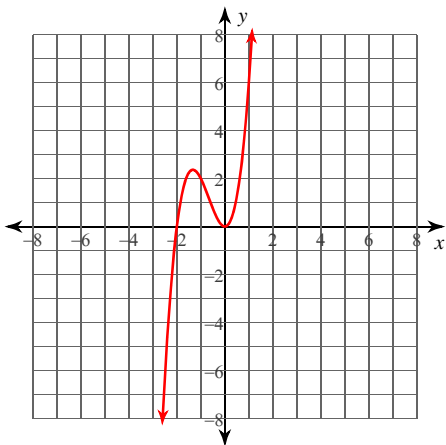
Increasing: $(-\infty, \frac{1}{3}), (1, \infty)$ Decreasing: $(\frac{1}{3}, 1)$

Inflection point at: $x = \frac{2}{3}$

Concave up: $(\frac{2}{3}, \infty)$ Concave down: $(-\infty, \frac{2}{3})$

Relative minimum: $(1, 0)$ Relative maximum: $(\frac{1}{3}, \frac{2}{81})$

$$5) y = 2x^3 + 4x^2$$



x-intercepts at $x = -2, 0$ y-intercept at $y = 0$

No vertical asymptotes exist.

No horizontal asymptotes exist.

Critical points at: $x = -\frac{4}{3}, 0$

Increasing: $(-\infty, -\frac{4}{3}), (0, \infty)$ Decreasing: $(-\frac{4}{3}, 0)$

Inflection point at: $x = -\frac{2}{3}$

Concave up: $(-\frac{2}{3}, \infty)$ Concave down: $(-\infty, -\frac{2}{3})$

Relative minimum: $(0, 0)$ Relative maximum: $(-\frac{4}{3}, \frac{64}{27})$