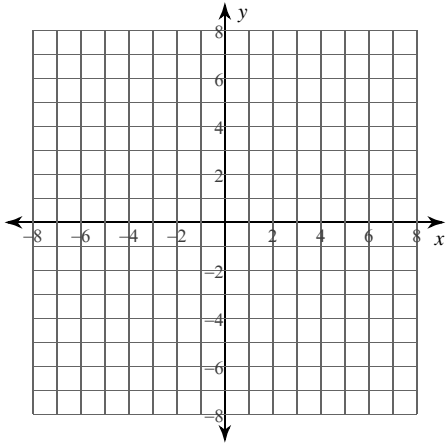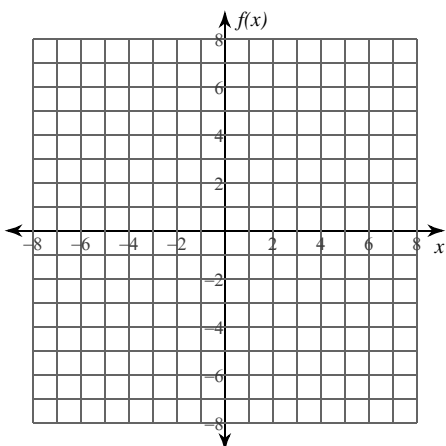Name_____

Calculus Practice: Curve Sketching 1

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.
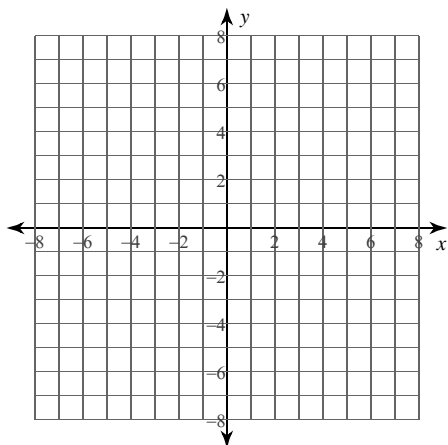
1) $y = -x^2 - 4x - 2$

2) $f(x) = -x^2 + 1$

3) $y = x^2 - 6x + 4$

4) $y = -2x^2 - 4x - 2$

5) $f(x) = 2x^2$

Name_____

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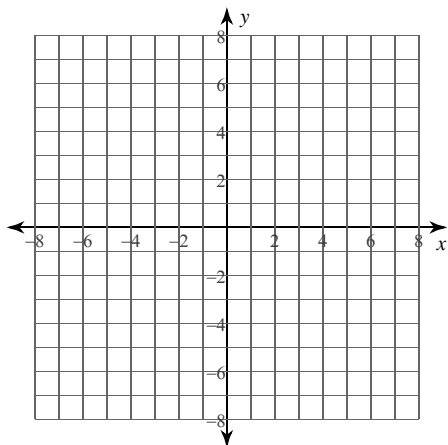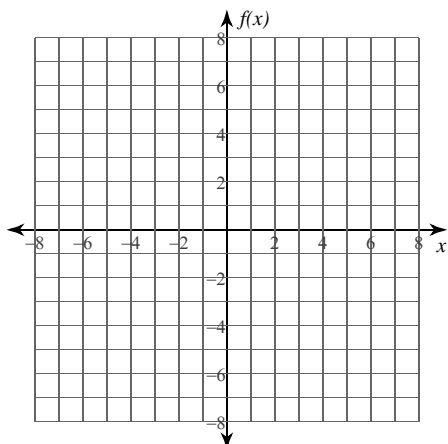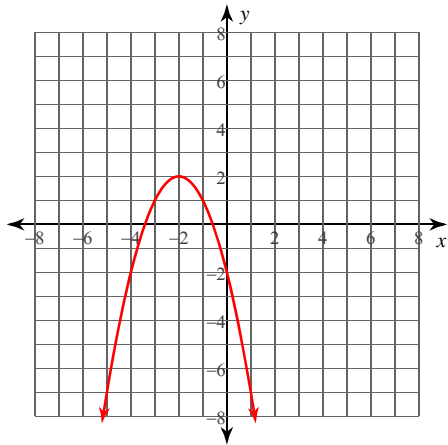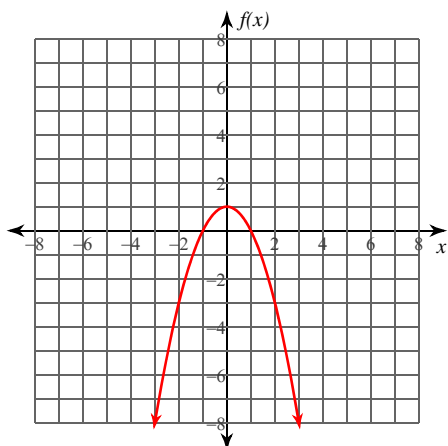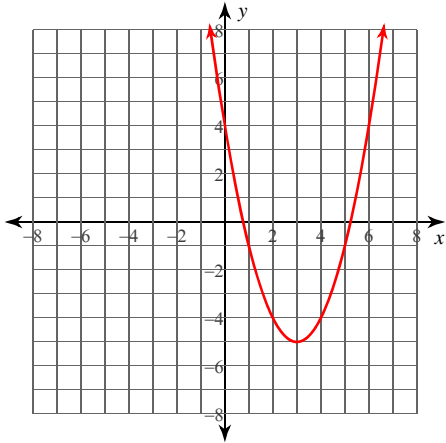
1) $y = -x^2 - 4x - 2$

x-intercepts at $x = -2 - \sqrt{2}, -2 + \sqrt{2}$ y-intercept at $y = -2$
No vertical asymptotes exist.
No horizontal asymptotes exist.
Critical point at: $x = -2$
Increasing: $(-\infty, -2)$ Decreasing: $(-2, \infty)$
No inflection points exist.
Concave up: No intervals exist.   Concave down: $(-\infty, \infty)$
No relative minima.   Relative maximum: $(-2, 2)$

2) $f(x) = -x^2 + 1$

x-intercepts at $x = -1, 1$ y-intercept at $y = 1$
No vertical asymptotes exist.
No horizontal asymptotes exist.
Critical point at: $x = 0$
Increasing: $(-\infty, 0)$ Decreasing: $(0, \infty)$
No inflection points exist.
Concave up: No intervals exist.   Concave down: $(-\infty, \infty)$
No relative minima.   Relative maximum: $(0, 1)$

3) $y = x^2 - 6x + 4$

x-intercepts at $x = 3 - \sqrt{5}, 3 + \sqrt{5}$ y-intercept at $y = 4$
No vertical asymptotes exist.
No horizontal asymptotes exist.
Critical point at: $x = 3$
Increasing: $(3, \infty)$ Decreasing: $(-\infty, 3)$
No inflection points exist.
Concave up: $(-\infty, \infty)$ Concave down: No intervals exist.
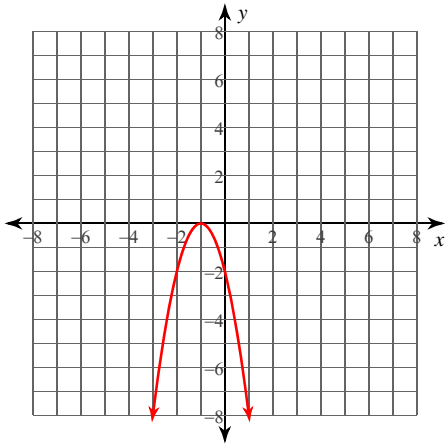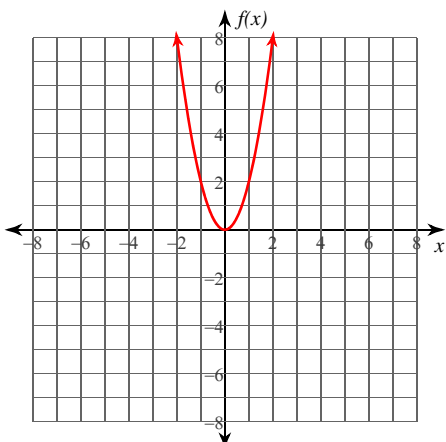Relative minimum: $(3, -5)$ No relative maxima.

4) $y = -2x^2 - 4x - 2$

x-intercept at $x = -1$ y-intercept at $y = -2$
No vertical asymptotes exist.
No horizontal asymptotes exist.
Critical point at: $x = -1$
Increasing: $(-\infty, -1)$ Decreasing: $(-1, \infty)$
No inflection points exist.
Concave up: No intervals exist.   Concave down: $(-\infty, \infty)$
No relative minima.   Relative maximum: $(-1, 0)$

5) $f(x) = 2x^2$

x-intercept at $x = 0$ y-intercept at $y = 0$
No vertical asymptotes exist.
No horizontal asymptotes exist.
Critical point at: $x = 0$
Increasing: $(0, \infty)$ Decreasing: $(-\infty, 0)$
No inflection points exist.
Concave up: $(-\infty, \infty)$ Concave down: No intervals exist.
Relative minimum: $(0, 0)$ No relative maxima.