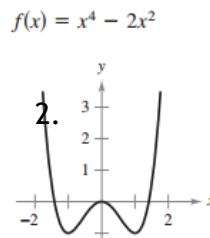
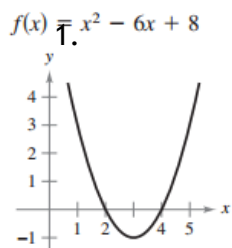


1st DERIVATIVE TEST

Due Tuesday!

Name the open intervals that each is increasing or decreasing.



Find the critical numbers, find the open intervals that the function is increasing or decreasing, apply the First Derivative Test to identify the relative extrema.

3. $f(x) = -x^2 - 100x$

4. $f(x) = -2x^2 + 4x + 3$

5. $f(x) = x^3 - 6x^2 + 15$

6. $f(x) = x^{2/3} - 4$

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

8. $f(x) = \frac{x^2}{x+1}$

9. $f(x) = x + 2\sin x$

10. $f(x) = x^4 - 32x + 4$

11. $f(x) = x^{1/3} - 2$

Answers!

1. Inc: $(3, \infty)$ Dec: $(-\infty, 3)$

2. Inc: $(-1, 0)$ $(1, \infty)$ Dec: $(-\infty, -1)$ $(0, 1)$

3. Inc: $(-\infty, -50)$ Dec: $(-50, \infty)$

Relmax at $x = -50$

4. Inc: $(-\infty, 1)$ Dec: $(1, \infty)$

Relmax at $x = 1$ Relmin: none

5. Inc: $(-\infty, 0)$ $(4, \infty)$ Dec: $(0, 4)$

Relmax at $x = 0$ Relmin: $x = 4$

6. Inc: $(0, \infty)$ Dec: $(-\infty, 0)$

Relmax: none Relmin at $x = 0$

7. Inc: $(-\infty, 0)$ Dec: $(0, \infty)$

Relmax: none Relmin: none

8. Inc: $(-\infty, -2)$ $(0, \infty)$ Dec: $(-2, -1)$ $(-1, 0)$

Relmax at $x = -2$ Relmin at $x = 0$

9. Inc: $\left(0, \frac{2\pi}{3}\right)$ $\left(\frac{4\pi}{3}, 2\pi\right)$ Dec: $\left(\frac{2\pi}{3}, \frac{4\pi}{3}\right)$

Relmax at $x = \frac{2\pi}{3}$ Relmin at $x = \frac{4\pi}{3}$

10. Inc: $(2, \infty)$ Dec: $(-\infty, 2)$

Relmax: none Relmin at $x = 2$

11. Inc: $(-\infty, \infty)$ Dec: never

Relmax: none Relmin: none