

Functions to Graph

Directions: Graph each function perfectly.

Requirements for each graph:

1. Find and label all x-intercepts
2. Find and label all y-intercepts
3. Find and label all local maxima/minima
4. Find and label all points of inflections
5. Find and label all asymptotes (horizontal, vertical, oblique)
6. List all increasing/decreasing intervals
7. List all intervals of concavity (up and down)
8. List the domain and range of your function in interval notation

Show all algebraic steps and use exact terms when possible (you can approximate using a calculator to plot the point, but always label the point with the exact term if it can be found).

1. $f(x) = 3x^5 - 5x^3 + 3$

2. $f(x) = \sqrt[3]{x^2}(3 - 2\sqrt[3]{x})$

3. $f(x) = x\sqrt{9 - x^2}$

4. $f(x) = \sin^2 x$ on $[0, 2\pi]$

5. $f(x) = x^2 e^{-x}$

6. $f(x) = x \ln(x^2)$

7. $f(x) = 4xe^{2x}$

8. $f(x) = e^x(x^2 - 2)$

9. $f(x) = e^x(x^3 - 4)$