

Name:

Date:

6 – 4.5 An Algorithm for Curve Sketching

Lesson Goals:

- Be able to use the algorithm for curve sketching to sketch functions

1) Algorithm for Curve Sketching

- Advanced Functions graphing steps:
 - 1) Domain
 - 2) x -intercepts and y -intercepts
 - 3) Holes
 - 4) Vertical asymptotes
 - 5) Horizontal (or slant) asymptotes
- Calculus graphing steps:
 - 6) First derivative (y')
 - Critical points of y
 - Possible extrema
 - 7) Second derivative (y'')
 - Critical points of y''
 - Possible points of inflection
 - 8) Combined sign chart and identify
 - Intervals of increase/decrease using y' and local max/min
 - Intervals of concavity using y'' and points of inflection
 - Draw a matching shape of curve
 - 9) Graph the curve
 - Start with asymptotes, then points, then draw the shape between points
 - Consider your grid before drawing
 - Label with exact values when key points are not obvious on grid

2) Practice

Graph the following. Check your graph using graphing software.

1) $y = x^3 + 4x - 5$

2) $y = x^2 + \frac{16}{x}$

3) $y = x\sqrt{x+2}$

4) $y = x + \frac{1}{x}$

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

6) $y = (x^2 + 1)(x - 1)$

7) $y = \frac{1}{100}(x^5 - 5x^4)$

8) $y = (1 - x^2)^2 - 2$

9) $g(x) = x^4 - 3x^2 + 2x$

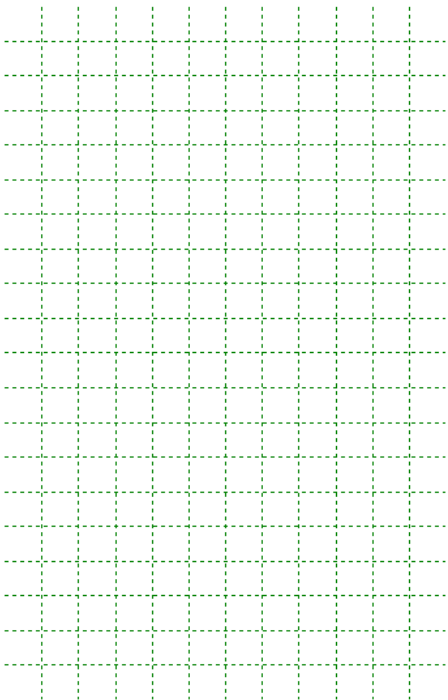
10) $f(x) = 3x^5 - 5x^3$

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

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

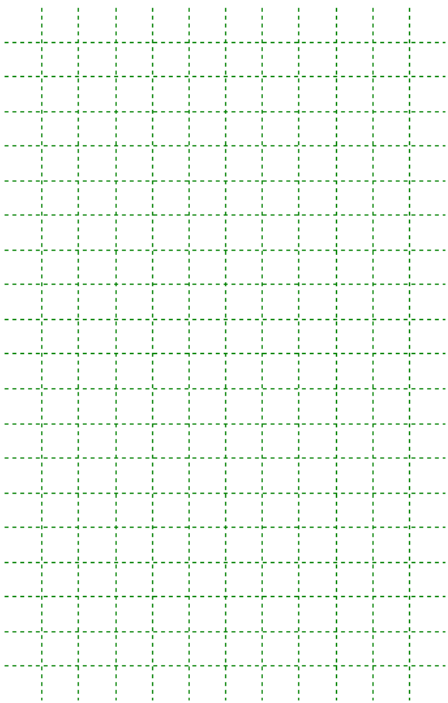
13) $f(x) = \frac{x^2}{1-x^2}$

Example 1: Graph $f(x) = x^{\frac{1}{3}}(x + 3)^{\frac{2}{3}}$.



Homework: Worksheet Practice 1-10

Example 2: Graph $f(x) = \frac{x^2-3x}{x-4}$.



Homework: Worksheet Practice 11-13 and Page 213 #4 (c, e, f-j), 6, 7, 9