

Name _____

Period _____ Date _____

Curve Sketching Review Worksheet

I. Sketch the following curves, indicating maximum and minimum points and points of inflection. Show all work and graph on a separate graph paper. *Use graphing calculator only to check your work!*

1. $y = 6 - 2x - x^2$

2. $y = 12 - 12x + x^3$

3. $y = x^3 - 3x^2 + 4$

For #3:

Derivative: _____

Increasing on (_____, _____), (_____, _____)

Decreasing on (_____, _____)

Relative maximum at (_____, _____)

Relative minimum at (_____, _____)

Second derivative: _____

Concave Up on (_____, _____)

Concave Down on (_____, _____)

Point of Inflection at (_____, _____)

II. Sketch a smooth curve illustrating the following characteristics or properties:

4. If y is a function of x such that $y' > 0$ for all x and $y'' < 0$ for all x , sketch the curve.

5. Sketch $y = f(x)$, given that

$$f(1) = 0$$

$$f'(x) < 0 \quad \text{for } x < 1$$

$$f'(x) > 0 \quad \text{for } x > 1$$

6. Sketch $y = f(x)$, given that

$$f(1) = -2$$

$$f''(x) < 0 \quad \text{for } x < 1$$

$$f''(x) > 0 \quad \text{for } x > 1$$

7. Sketch $y = f(x)$, given that

$$f(-2) = 8$$

$$f(0) = 4$$

$$f(2) = 0$$

$$f''(x) > 0 \quad \text{for } x > 0$$

$$f'(2) = f'(-2) = 0$$

$$f'(x) < 0 \quad \text{for } |x| < 2$$

$$f''(x) < 0 \quad \text{for } x < 0$$

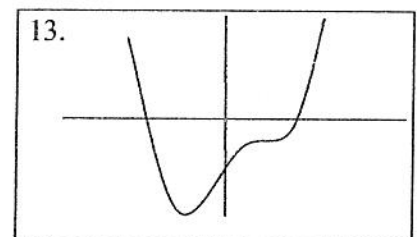
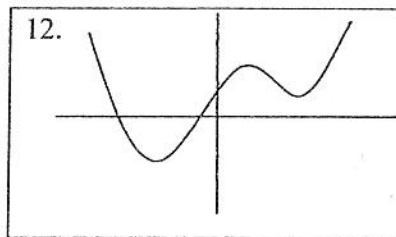
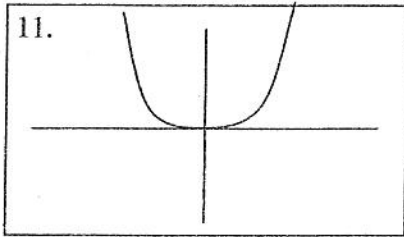
$$f'(x) > 0 \quad \text{for } |x| > 2$$

8. Sketch the function which is
Increasing on $(-\infty, 0)$ and $(2, \infty)$
Decreasing on $(0, 2)$
Concave up on $(1, \infty)$
Concave down on $(-\infty, 1)$
Relative maximum at $(0, 4)$
Relative minimum at $(2, 0)$
Point of inflection at $(1, 1)$
9. Sketch the curve with
 y -axis symmetry
horizontal asymptote: $y = 0$
vertical asymptotes: $x = -2, x = 2$
increasing on $(0, 2)$ and $(2, \infty)$
decreasing on $(-\infty, -2)$ and $(-2, 0)$
concave up on $(-2, 2)$
concave down on $(-\infty, -2)$ and $(2, \infty)$
 $f(0) = 2$
10. Sketch the curve which is
Increasing on $(-\infty, 0)$ and $(1, \infty)$
Decreasing on $(0, 1)$
Tangent with undefined slope at the origin
Horizontal tangent at $(1, -1)$
Concave up for all x except $x = 0$
No concavity at $(0, 0)$

Use the Graphing Calculator and substitute values for a , b , c , d , and e in the equation

$$y = ax^4 + bx^3 + cx^2 + dx + e$$

to get each of the three types of curves illustrated.



11. $a =$ _____ $b =$ _____ $c =$ _____ $d =$ _____ $e =$ _____

12. $a =$ _____ $b =$ _____ $c =$ _____ $d =$ _____ $e =$ _____

13. $a =$ _____ $b =$ _____ $c =$ _____ $d =$ _____ $e =$ _____