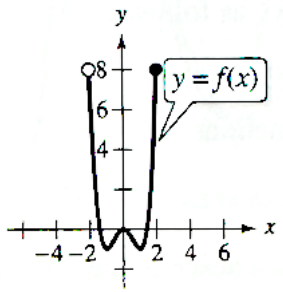
U1 L5A Practice Analyzing Graphs of Functions

Name: _____ HR: _____

Group A — Reading Graphs & the Vertical Line Test

Problems 1–2: Use the graph of f to find the domain and range of f and each function value. (Textbook #7, #9)

1.



(a) f(−1) =

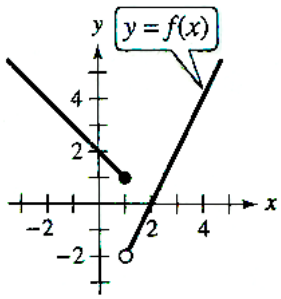
(b) f(0) =

(c) f(1) =

(d) f(2) =

Domain:

2.



(a) f(2) =

(b) f(1) =

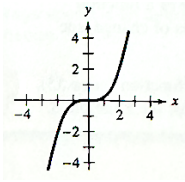
(c) f(3) =

(d) f(−1) =

Domain:

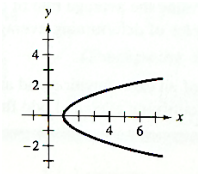
Problems 3–6: Use the Vertical Line Test to decide whether each graph represents y as a function of x. Circle one. (Textbook #11–14)

3.



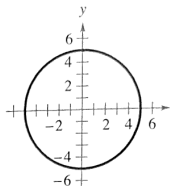
Function? Yes / No

4.



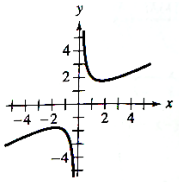
Function? Yes / No

5.



Function? Yes / No

6.



Function? Yes / No

Group B — Finding Zeros Algebraically, Checking Graphically

*Find the zeros of each function **algebraically**. Then graph it in Desmos or on the TI-84 and record the x-intercepts to check your work.*

7. $f(x) = 2x^2 - 7x - 30$

Graph check — calculator zeros: _____

8. $f(x) = \dfrac{x+3}{2x^2-6}$

Graph check — calculator zeros: _____

9. $f(x) = \dfrac{1}{3}x^3 - 2x$

Graph check — calculator zeros: _____

10. $f(x) = -25x^4 + 9x^2$

Graph check — calculator zeros: _____

11. $f(x) = x^3 - 4x^2 - 9x + 36$

Graph check — calculator zeros: _____

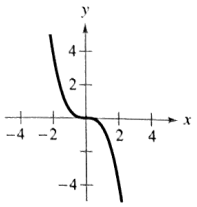
Strategy Reminders

- Set f(x) = 0 and solve for x.
- Always look for a GCF first.
- 4 terms? Try factoring by grouping.
- Fraction: set the numerator = 0, then check that the denominator is NOT 0 there.
- Graph check: the zeros are the x-intercepts. Your algebra answers and the calculator's answers must match (use decimals to compare radicals).

Group C — Describing Function Behavior from a Graph

Determine the open intervals on which each function is increasing, decreasing, or constant. Write "none" if there are none. (Textbook #33–40)

12. $f(x) = -\frac{1}{2}x^3$

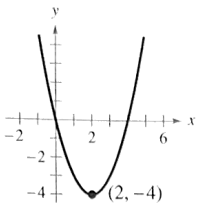


Increasing:

Decreasing:

Constant:

13. $f(x) = x^2 - 4x$

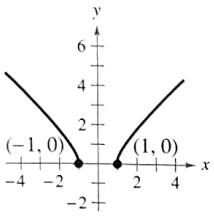


Increasing:

Decreasing:

Constant:

14. $f(x) = \sqrt{x^2 - 1}$

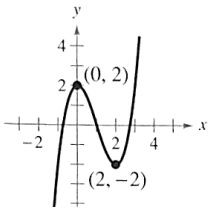


Increasing:

Decreasing:

Constant:

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

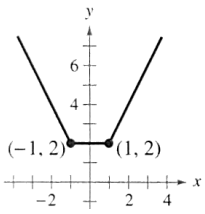


Increasing:

Decreasing:

Constant:

16. $f(x) = |x + 1| + |x - 1|$

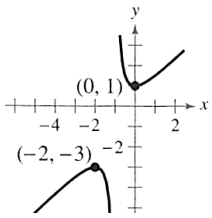


Increasing:

Decreasing:

Constant:

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

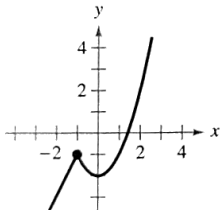


Increasing:

Decreasing:

Constant:

18. $f(x) = \begin{cases} 2x + 1, & x \le -1 \\ x^2 - 2, & x > -1 \end{cases}$

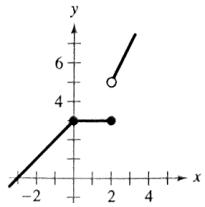


Increasing:

Decreasing:

Constant:

19. $f(x) = \begin{cases} x + 3, & x \le 0 \\ 3, & 0 < x \le 2 \\ 2x + 1, & x > 2 \end{cases}$



Increasing:

Decreasing:

Constant:

Graph each function in Desmos or on the TI-84. State the open intervals where it is increasing and decreasing, and approximate any relative minima or maxima to two decimal places as points (x, y).

Function	Increasing on	Decreasing on	Relative min / max (x, y)
20. $f(x) = 3x^4 - 6x^2$			*min:* *max:*
21. $f(x) = x\sqrt{x + 3}$			*min:* *max:*
22. $h(x) = x^3 - 6x^2 + 15$			*min:* *max:*
23. $f(x) = x^3 - 3x^2 - x + 1$			*min:* *max:*
24. $g(x) = x\sqrt{4 - x}$			*min:* *max:*