Lesson 1.3 A Answers

1. e

3. j

5. i

7. k

9. d

11. l

13. Ex. 8

15. Ex. 7 & 8

17. Ex. 2, 4, 6, 10, 11 & 12

19. $y = x$, $y = x^3$, $y = 1/x$ $y = \sin x$

21. $y = x^2$, $y = 1/x$, $y = |x|$

23. $y = 1/x$, $y = e^x$, $y = 1/(1 + e^{-x})$

25. $y = 1/x$, $y = \sin x$, $y = \cos x$, $y = 1/(1 + e^{-x})$

27. $y = x$, $y = x^3$, $y = 1/x$, $y = \sin x$

69. a) $f(x) = 1/x$, $f(x) = e^x$, $f(x) = \ln x$, $f(x) = \cos x$
$f(x) = 1/(1 + e^{-x})$

b) $f(x) = x$

c) $f(x) = e^x$

d) $f(x) = \ln x$

e) The odd functions: x, x^3, $1/x$ and $\sin x$

7.77

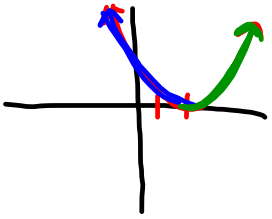
Section 1-3, Day 2

Analyzing Functions Graphically

- Students will be able to recognize graphs of twelve basic functions
- Students will be able to determine the domains of functions related to the twelve basic functions
- Students will be able to combine the twelve basic functions in various ways to create new functions

Analyzing Functions Graphically

Graph the function $y = (x - 2)^2$. Then answer the following questions:



a. On what interval is the function increasing? Decreasing?

INC $(2, \infty)$ DEC $(-\infty, 2)$

b. Is the function odd, even or neither?

c. Does the function have any extrema?

absolute min (local/relatives) $y = 0$ @ $x = 2$

d. How does the graph relate to the graph of the basic function $y = x^2$

shifted 2 units right

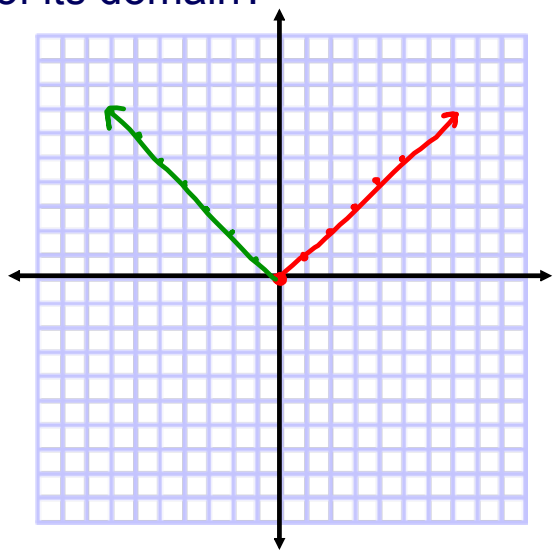
Identifying a Piecewise-Defined Function

Which of the twelve basic function has the following **piecewise** definition over separate intervals of its domain?

$$f(x) = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$$

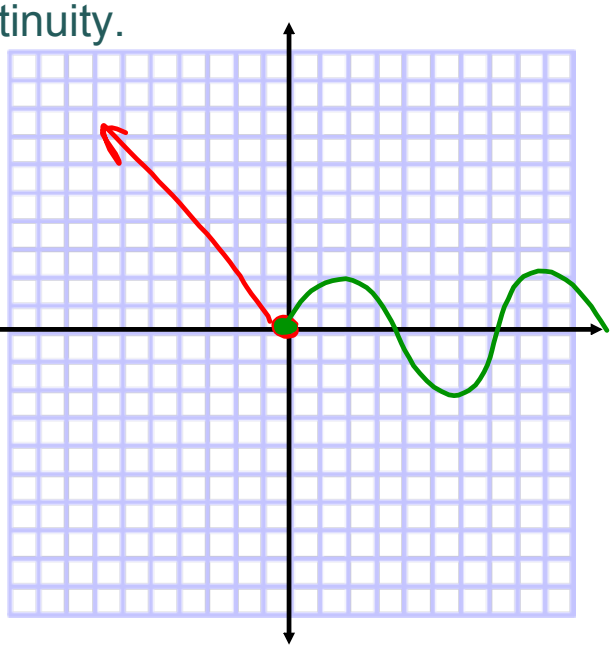
x	y
0	0
1	1
2	2
3	3

x	y
-1	-(-1) 1
-2	-(-2) 2
-3	-(-3) 3



47. Sketch the graph of the piecewise-defined function. Give any points of discontinuity.

$$f(x) = \begin{cases} |x| & \text{if } x < 0 \\ \sin x & \text{if } x \geq 0 \end{cases}$$

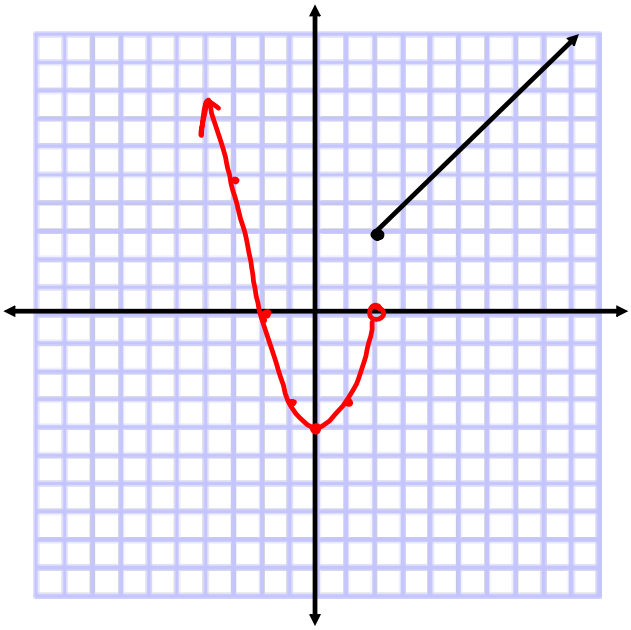


45. Sketch the graph of the piecewise-defined function. Give any points of discontinuity.

$$f(x) = \begin{cases} x+1 & x \geq 2 \\ [illegible] & [illegible] \\ x^2-4 & x<2 \end{cases}$$

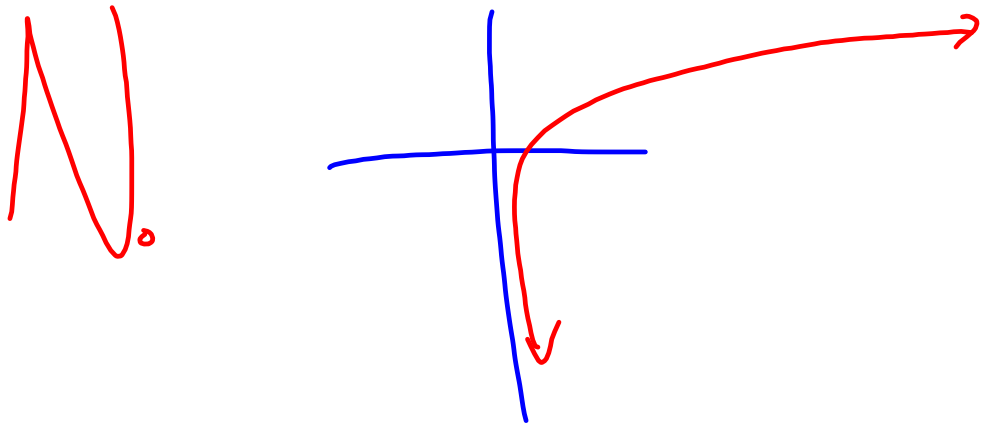
x	y
2	3
3	4
4	5

x	y
2	0
1	-3
0	-4
-1	-3
-2	0



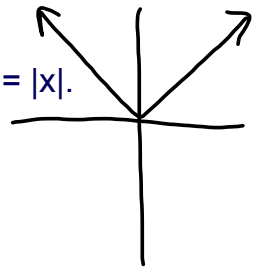
Looking for a Horizontal Asymptote

Does the graph of y = lnx have a horizontal asymptote?



Analyzing a Function

Give a complete analysis of the function f(x) = |x|.



Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

Continuity: CONTINUOUS

Increasing: $(0, \infty)$

Decreasing: $(-\infty, 0)$

Constant: ——

CONSTANT

Relative Max/Min: Absolute Min $y = 0$ $y = 0$ @ $x = 0$

Symmetry (Even, Odd, Neither): Even

End Behavior:

$$\lim_{x \to \infty} |x| = \infty$$

$$\lim_{x \to -\infty} |x| = \infty$$

HW Pg 106. #'s 30 - 63, multiples of 3