

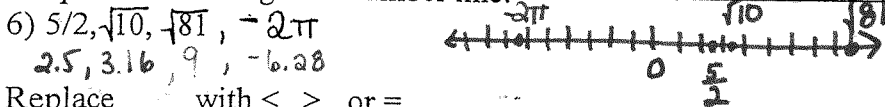
Review - Chapter 1

Name Key

To which set of numbers does each number belong? (natural, whole, integers, rational, irrational)

- 1) -5 Rat'l Integer 2) 12 rat'l int. Whole natural 3) $\sqrt{17}$ Irrat'l 4) 5π Irrat'l 5) 0 rat'l int. Whole

Graph the following on a number line.



Replace with $<$, $>$, or $=$

- 7) $-2.5 < |-2.4|$ 8) $2\sqrt{2} < 2\sqrt{8}$ 9) $-18 > -70$ 10) $\pi > 3.12$

Find the reciprocal for each number

- 11) 5 $\frac{1}{5}$ 12) $-\frac{3}{4}$ $-\frac{4}{3}$ 13) $7\frac{2}{3}$ $\frac{3}{23}$ 14) $\frac{1}{4}$ 4

Simplify each expression.

- 15) $|-9-15|$ 24 16) $|-4| + |-44| - |9|$ 39 17) $4|-3|$ 12 18) $|7-10|$ 3

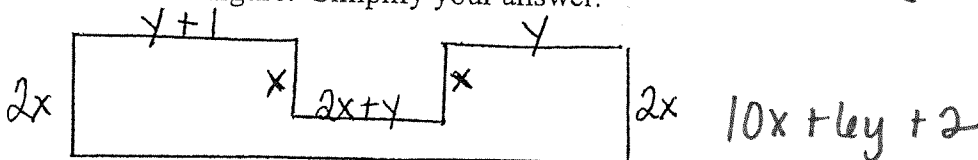
Evaluate each expression.

- 19) $4p - 3q + 8$; $p = -3, q = -8$ 20 20) $-3m^2 - (m+n)^2$; $m = -2, n = -3$ -37
 21) $3x - 2y + 5x + 7y - 10x - 3y$; $x = -1, y = 3$ 8 22) $3|2a+5| + 2|3-a|$; $a = -2$ 13
 23) $|4b-4| + |3-b^2| + 2b^3$; $b = 2$ 21 24) $-2x^3 - x^2 + 5x + 2$; $x = -3$ 32

Simplify by combining like terms.

- 25) $5 - 3(x+y) + 4(x-3y)$ $x - 15y + 5$ 26) $3y^2 + 8 - (7y^2 + 12)$ $-4y^2 - 4$ 27) $-4(a+b) + 5(b+2a)$ $6a + b$

28) Find the perimeter of the figure. Simplify your answer.



29) Solve for the indicated variable.

- A) $P = 2l + 2w$; for w $\frac{P-2l}{2} = w$ B) $A = \frac{1}{2}bh$; for h $\frac{2A}{b} = h$ C) $K = \frac{1}{3}t^2g - 4h$; for h $\frac{K - \frac{1}{3}t^2g}{-4} = h$

Solve each equation.

- 30) $14x - 15 = -7x + 48$ $x = 3$ 31) $5(1 - 3m) = 30 - 2(4m + 7)$ $m = -1.57 (-\frac{11}{7})$
 32) $2(3y - 5) = 2y + 6$ $y = 4$ 33) $11 + 3(-8 + 5t) = 16t - 5$ $t = -8$

34) $|2x+3| = 7$

$x = 2 \quad x = -5$

Solve, graph, and write in interval notation.

36) $9(2+h) - 4h < 3h - 10$
 $h < -14$
 $(-\infty, -14)$

38) $2r - 9 > -9$ $r > 0$ $(0, \infty)$

40) $2|4t-1| + 6 > 20$
 $t > 2$ or $t < -\frac{3}{2}$
 $(-\infty, -\frac{3}{2}) \cup (2, \infty)$

42) $|2x+3| < -10$ No Sol.

35) $4|2y+3| - 7 = 9$

$y = \frac{1}{2} \quad y = -\frac{7}{2}$

37) $3m - 5 - 7m + 12 + m - 20 \geq 17$
 $m \leq -10$
 $(-\infty, -10]$

39) $2(4y-5) < -10$ $y < 0$ $(-\infty, 0)$

41) $|3x-4| + 5 \leq 27$ $-6 \leq x \leq \frac{26}{3}$
 $[-6, \frac{26}{3}]$

43) $|-4x+3| \geq -3$ \mathbb{R}
 $(-\infty, \infty)$

Solve the compound inequality.

44) $5x + 10 \geq 10$ and $7x - 7 \leq 14$
 $x \geq 0$ and $x \leq 3$
 $[0, 3]$

45) $-2 \leq 2x - 4 < 4$

46) $4x - 5 < -17$ or $5x + 6 > 31$
 $x < -3$ or $x > 5$
 $(-\infty, -3) \cup (5, \infty)$

$1 \leq x < 4$
 $[1, 4)$

Find the Probability

47) A hat contains the numbers 1-100. Find the probability of picking:

a) an even number

$\frac{50}{100} = \frac{1}{2}; 50\%$

b) a multiple of 10

$\frac{10}{100} = \frac{1}{10}; 10\%$

c) a number in the 50's

$\frac{10}{100} = \frac{1}{10}; 10\%$

d) a number less than 60

$\frac{59}{100}; 59\%$

e) the number 5

$\frac{1}{100}; 1\%$

f) a prime number

$\frac{25}{100} = \frac{1}{4}; 25\%$

g) an odd number

$\frac{50}{100} = \frac{1}{2}; 50\%$

h) a multiple of 6

$\frac{16}{100} = \frac{4}{25}; 16\%$

Name Key

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the domain of the given function.

1) $f(x) = \sqrt{9-x}$

1) $(-\infty, 9]$

2) $f(x) = \frac{x}{x-8}$

2) $(-\infty, 8) \cup (8, \infty)$

3) $f(x) = \frac{\sqrt{x+6}}{(x+2)(x-5)}$

3) $[-6, -2) \cup (-2, 5) \cup (5, \infty)$

Determine if the function is bounded above, bounded below, bounded on its domain, or unbounded on its domain.

4) $y = 10$

4) Bounded

5) $8^x + 3$

5) Bounded below

6) $y = 8 - x^2$

6) Bounded above

Solve the problem.

7) Estimate graphically the local maximum and local minimum of $f(x) = 4x^2 - 2x + 5$.

7) min @ 4.75

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

8) Estimate graphically the local maximum and local minimum of $f(x) = \frac{1}{3}x^3 + x^2 - 3x$.

8) A

A) Local maximum: 9; local minimum: -1.67

B) Local maximum: 8.53; local minimum: -2.01

C) Local maximum: 9; local minimum: 1.06

D) Local maximum: 1.67; local minimum: -9

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Identify intervals on which the function is increasing, decreasing, or constant.

9) $f(x) = x^3 - x^2 + 2$

Inc: $(-\infty, 0]$
9) $[.67, \infty)$

Determine algebraically whether the function is even, odd, or neither even nor odd.

10) $f(x) = 3x^2 - 3$

Dec. $[0, .67]$

10) Even

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

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

A) Even

B) Neither

C) Odd

11) C

12) $f(x) = 3x - 6|x|$

A) Even

B) Neither

C) Odd

12) B

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the asymptote(s) of the given function.

13) $h(x) = \frac{(x-1)(x+5)}{x^2-4}$ vertical asymptotes(s)

13) $x = -2, x = 2$

14) $g(x) = \frac{x+8}{x^2-2}$ horizontal asymptotes(s)

14) $y = 0$

15) $f(x) = \frac{x-2}{x^2+3x}$ vertical asymptotes(s)

15) $x = 0, x = -3$

16) $h(x) = \frac{32x^2}{8x^2-5}$ horizontal asymptotes(s)

16) $y = 4$

Perform the requested operation or operations. Find the domain of each.

17) $f(x) = 6x + 8, g(x) = 3x^2$
Find $(fg)(x)$.

17) $18x^3 + 24$
 $(-\infty, \infty)$

18) $f(x) = \sqrt{x-5}, g(x) = \cos x$
Find $f-g$.

18) $\sqrt{x-5} - \cos x$
 $[5, \infty)$

Perform the requested operation or operations.

19) $f(x) = 7x + 14, g(x) = 4x - 1$
Find $f(g(x))$.

19) $28x + 7$

20) $f(x) = \frac{x-6}{7}, g(x) = 7x + 6$, find $g(f(x))$.

20) x

21) $f(x) = x^2 + 9, g(x) = \sqrt{x-3}$
Find $g(f(x))$.

21) $\sqrt{x^2+6}$

Find functions f and g so that $h(x) = f(g(x))$.

22) $y = \frac{1}{x^2-6}$

22) $f(x) = \frac{1}{x}$
 $g(x) = x^2 - 6$

23) $y = |8x + 3|$

$f(x) = |x|$

Find the inverse of the function.

24) $f(x) = 2x - 3$ $f^{-1}(x) = \frac{x+3}{2}$

23) $g(x) = 8x + 3$

25) $f(x) = \frac{6}{x+3}$ $f^{-1}(x) = \frac{6-3x}{x} = \frac{6}{x} - 3$

24) _____

25) _____

Confirm that f and g are inverses by showing that $f(g(x)) = x$ and $g(f(x)) = x$.

26) $f(x) = 8x + 9$ and $g(x) = \frac{x-9}{8}$

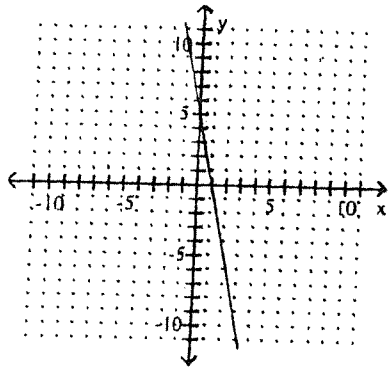
26) _____

$(f \circ g)(x) = 8\left(\frac{x-9}{8}\right) + 9 = x - 9 + 9 = x \checkmark$ $(g \circ f)(x) = \frac{8x+9-9}{8} = \frac{8x}{8} = x \checkmark$

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Determine if the function is one-to-one.

27)

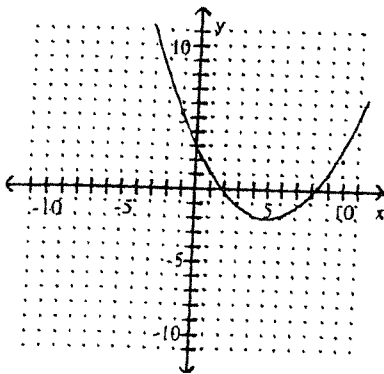


27) B) Yes

A) No

B) Yes

28)



28) B) No

A) Yes

B) No

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Describe how the graph of $y = x^2$ can be transformed to the graph of the given equation.

29) $y = (x - 16)^2 - 10$

Rt. 16, down 10

29) _____

Fill in the blanks to complete the statement.

30) The graph of $y = -\sqrt{x+6}$ can be obtained from the graph of $y = \sqrt{x}$ by shifting horizontally 6 units to the left and reflecting across the x-axis.

30) 6, left,
x

31) The graph of $y = -2x^3 + 9$ can be obtained from the graph of $y = x^3$ by vertically stretching by a factor of 2; reflecting across the x-axis, and shifting vertically 9 units in the up direction.

31) 2, x, 9, up

Give the equation of the function g whose graph is described.

32) The graph of $f(x) = |x|$ is vertically stretched by a factor of 4.5. This graph is then reflected across the x -axis. Finally, the graph is shifted 0.47 units downward.

32) $y = -4.5|x| - 0.47$

33) The graph of $f(x) = x^2 - 4x + 3$ is horizontally shrunk by a factor of $1/4$.

33) _____

Fill in the blanks

34 The Vertical line test test determines whether a graph represents a function.

35 The Horizontal line test test determines whether a function's inverse is a function.

36 A function is 1-1 if it passes both of the above tests.

37 The set of all x -values (or inputs) is called the domain of the function. The x -variable is the independent variable.

38 The set of all y -values (or outputs) is called the range of the function. The y -variable is the dependent variable.

Review Ch.1 Part 2

Honors Functions

1. Determine algebraically whether the function is even, odd, or neither.

$$f(x) = x^2 + 2x - 5$$

$$\begin{aligned} (-x)^2 + 2(-x) - 5 \\ x^2 - 2x - 5 \end{aligned}$$

neither

2. Identify any points of discontinuity and the type of discontinuity for the function

$$f(x) = \frac{x+2}{x^2+2x-15}$$

$$(x+5)(x-3)$$

pt. of dist.

$x = -5$; Infinite discontin.

$x = 3$; Infinite discontin.

Determine whether each function is bounded, bounded above, bounded below, or not bounded.

3. $y = e^{2x} + 3$

Bounded below

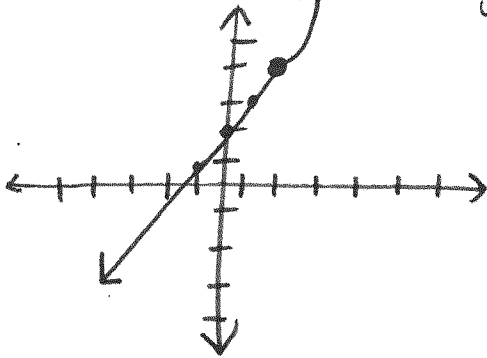
4. $Y = -3\sqrt{x+2}$

Bounded above

Sketch the graph of each function.

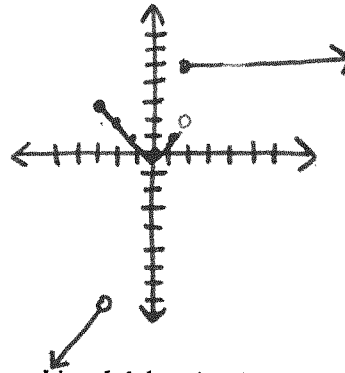
5. $f(x) = \begin{cases} x+2, & x < 2 \\ x^2, & x \geq 2 \end{cases}$

Is the function continuous at 2? *yes*



6. $f(x) = \begin{cases} 3x, & x < -3 \\ |x|, & -3 \leq x < 2 \\ 5, & x \geq 2 \end{cases}$

Is the function continuous at 2 or -3? *No No*



x	y = 3x	x	y = x
-3	-9	-3	3
-2	-6	-2	2
-1	-3	-1	1
0	0	0	0
1	3	1	1
2	6	2	2

x	y = 5
2	5
3	5
4	5

7. Use your calculator to find the line of best fit for the data. Use L1 beginning with 2 for 1992 and the number of children in L2. The table shows the estimated number of U.S. children that were home-schooled in the years from 1992 to 1997.

Year	Number
1992	703,000
1993	808,000
1994	929,000
1995	1,060,000
1996	1,220,000
1997	1,347,000

Write the regression equation for the line of best fit.

$$y = 131057.143x + 421409.524$$