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Chapter 8: Functions

Relation and Functions

Determine whether each relation is a function. Then state the domain and range of each relation.

1)

Function:

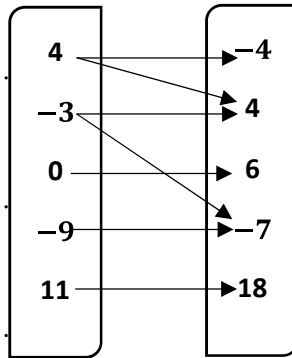
.....

Domain:

.....

Range:

.....



2)

Function:

.....

Domain:

.....

Range:

.....

x	y
1	3
4	0
-9	-2
1	-2
-10	5

3)

Function:

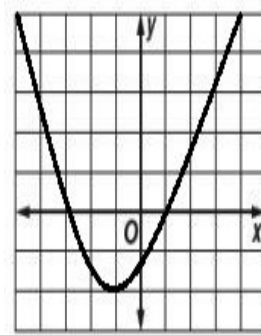
.....

Domain:

.....

Range:

.....



4) $\{(1, -1), (6, 0), (0, 8), (4, 3), (2, 5)\}$

Function:

.....

Domain:

.....

Range:

.....

5)

Function:

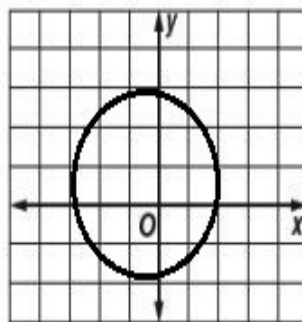
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Domain:

.....

Range:

.....



6)

Function:

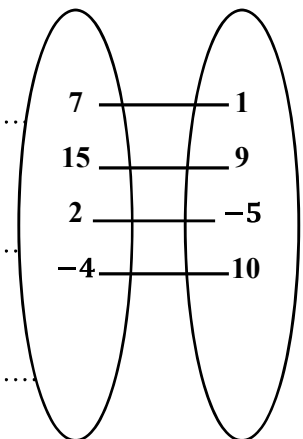
.....

Domain:

.....

Range:

.....



Slope form

Write the slope-intercept form of the equation of each line.

1) $5x + 3y = 15$

8) $7x - 5y = -3$

2) $4x + 12y = 3$

9) $-0.3x + 5y = 25$

3) $7x + y = -9$

10) $-6x + \frac{1}{2}y = 10$

4) $-3x + 8y = 5$

11) $12x + y = 0$

5) $3x - 2y = 9$

12) $9x = -45y - 10$

6) $-14x + 2y = 4$

13) $3.5x = 7y + 7$

7) $5x + y = 2$

14) $8x = -\frac{2}{5}y + 10$

Slope and Y-Intercept

Find the slope and y-intercept of each equation.

1) $y = \frac{1}{4}x + 3$

6) $y = -8x + 5$

2) $y = 9x + 5$

7) $x = -16$

3) $x - 7y = 21$

8) $y = 2x$

4) $y = 3x + 20$

9) $y - 6 = 7(x + 1)$

5) $y = 7$

10) $x = -\frac{12}{5}y - 12$

Slope and One Point

Find a Point-Slope equation for a line containing the given point and having the given slope.

1) $m = -3, (0, 1)$

14) $m = \text{undefined}, (7, -7)$

2) $m = 2, (2, 1)$

15) $m = -\frac{1}{4}, (4, 2)$

3) $m = -1, (-1, -1)$

16) $m = \frac{1}{5}, (2, 4)$

4) $m = 4, (2, 2)$

17) $m = -5, (1, 3)$

5) $m = 3, (1, 5)$

18) $m = 3, (-1, -2)$

6) $m = \frac{1}{2}, (4, 2)$

19) $m = \frac{1}{7}, (7, 1)$

7) $m = 1, (-1, -4)$

20) $m = \frac{-2}{3}, (1, -1)$

8) $m = 0, (4, -7)$

21) $m = \frac{1}{3}, (3, 3)$

9) $m = 5, (1, 0)$

22) $m = -6, (0, -2)$

10) $m = \frac{1}{7}, (-3, -2)$

23) $m = 1, (1, -5)$

11) $m = -2, (4, -1)$

24) $m = -\frac{3}{4}, (4, -4)$

12) $m = -3, (1, -3)$

25) $m = 0, (-1, 15)$

13) $m = 4, (0, 2)$

26) $m = \text{Undefined}, (-5, -6)$

Slope of Two Points

Write the slope-intercept form of the equation of the line through the given points.

1) $(3, 0), (-3, 6)$

13) $(1, 1), (-2, 13)$

2) $(4, 1), (-4, 5)$

14) $(7, 7), (-5, 10)$

3) $(5, 2), (-2, 9)$

15) $(6, 5), (-2, 13)$

4) $(1, 10), (-1, 12)$

16) $(3, 6), (8, 11)$

5) $(5, 15), (-7, 9)$

17) $(9, 0), (5, 2)$

6) $(2, 14), (-8, 4)$

18) $(1, 8), (-2, 9)$

7) $(3, 2), (-4, 16)$

19) $(4, -2), (-11, 8)$

8) $(4, 7), (-8, 10)$

20) $(3, -4), (-7, 1)$

9) $(3, 5), (4, 6)$

21) $(5, 1), (-11, 5)$

10) $(6, 2), (5, 2)$

22) $(3, -7), (7, 9)$

11) $(1, 2), (2, 4)$

23) $(4, -6), (12, 2)$

12) $(2, 5), (-4, 7)$

24) $(9, 5), (8, 4)$

Equation of Parallel and Perpendicular lines

Write the slope-intercept form of the equation of the line described.

- 1) Through: $(-2, 6)$, parallel to $y = 3x + 15$
- 2) Through: $(-1, -8)$, parallel to $y = -5x$
- 3) Through: $(-5, 5)$, perpendicular to $y = \frac{1}{3}x + 4$
- 4) Through: $(4, 2)$, parallel to $y = -7x + 10$
- 5) Through: $(-10, -1)$, parallel to $y = \frac{2}{5}x - 9$
- 6) Through: $(3, 2)$, perpendicular to $y = -\frac{1}{4}x + 8$
- 7) Through: $(3, -4)$, perpendicular to $y = -3x - 7$
- 8) Through: $(-2, 4)$, perpendicular to $y = -\frac{1}{9}x + 6$
- 9) Through: $(0, -5)$, parallel to $3y + 6x = 7$
- 10) Through: $(1, 1)$, parallel to $y = \frac{1}{8}x - 3$
- 11) Through: $(2, -2)$, parallel to $y = 3$
- 12) Through: $(5, 1)$, perpendicular to $y = \frac{4}{3}x + 1$
- 13) Through: $(-1, 8)$, perpendicular to $4y - x = 16$
- 14) Through: $(5, 7)$, parallel to $5y + x = 2\frac{1}{4}$
- 15) Through: $(2, 1)$, perpendicular to $y = 3x + 12$
- 16) Through: $(-4, 2)$, parallel to $8y - x = 10$
- 17) Through: $(0, -2)$, perpendicular to $y = -x + \frac{1}{4}$
- 18) Through: $(-3, -3)$, perpendicular to $7y - 3x - 4 = 0$

Answers of Worksheets

Relation and Functions

- 1) No, $D_f = \{4, -3, 0, -9, 11\}$, $R_f = \{-4, 4, 6, -7, 18\}$
- 2) No, $D_f = \{1, 4, -9, -10\}$, $R_f = \{3, 0, -2, 5\}$
- 3) Yes, $D_f = (-\infty, \infty)$, $R_f = \{-2, \infty\}$
- 4) Yes, $D_f = \{1, 6, 0, 4, 2\}$, $R_f = \{-1, 0, 8, 3, 5\}$
- 5) No, $D_f = [-3, 2]$, $R_f = [-2, 3]$
- 6) Yes, $D_f = \{7, 15, 2, -4\}$, $R_f = \{1, 9, -5, 10\}$

Slope form

- | | | |
|--------------------------------------|-------------------------------------|---------------------------------------|
| 1) $y = -\frac{5}{3}x + 5$ | 6) $y = 7x + 2$ | 12) $y = -\frac{1}{5}x - \frac{2}{9}$ |
| 2) $y = -\frac{1}{3}x + \frac{1}{4}$ | 7) $y = -5x + 2$ | 13) $y = 0.5x - 1$ |
| 3) $y = -7x - 9$ | 8) $y = \frac{7}{5}x + \frac{3}{5}$ | 14) $y = -20x + 25$ |
| 4) $y = \frac{3}{8}x + \frac{5}{8}$ | 9) $y = 0.06x + 5$ | |
| 5) $y = \frac{3}{2}x - \frac{9}{2}$ | 10) $y = 12x + 20$ | |
| | 11) $y = -12x$ | |

Slope and Y-Intercept

- | | | |
|------------------------------|--|---------------------------------|
| 1) $m = \frac{1}{4}, b = 3$ | 5) $m = 0, b = 7$ | 9) $m = 7, b = 13$ |
| 2) $m = 9, b = 5$ | 6) $m = -8, b = 5$ | 10) $m = -\frac{5}{12}, b = -5$ |
| 3) $m = \frac{1}{7}, b = -3$ | 7) $m = \text{undefined},$
$b: \text{no intercept}$ | |
| 4) $m = 3, b = 20$ | 8) $m = 2, b = 0$ | |

Slope and One Point

- | | | |
|-----------------------|---------------------------------------|---------------------------------------|
| 1) $y = -3x + 1$ | 8) $y = -7$ | 15) $y = -\frac{1}{4}x + 3$ |
| 2) $y = 2x - 3$ | 9) $y = 5x - 5$ | 16) $y = \frac{1}{5}x + \frac{18}{5}$ |
| 3) $y = -x - 2$ | 10) $y = \frac{1}{7}x - \frac{11}{7}$ | 17) $y = -5x + 8$ |
| 4) $y = 4x - 6$ | 11) $y = -2x + 7$ | 18) $y = 3x + 1$ |
| 5) $y = 3x + 2$ | 12) $y = -3x$ | 19) $y = \frac{1}{7}x$ |
| 6) $y = \frac{1}{2}x$ | 13) $y = 4x + 2$ | 20) $y = -\frac{2}{3}x - \frac{1}{3}$ |
| 7) $y = x - 3$ | 14) $x = 7$ | 21) $y = \frac{1}{3}x + 2$ |

HiSET Practice Test 1

Mathematics

Total Number of Questions: 50 Questions

Total time: 90 Minutes

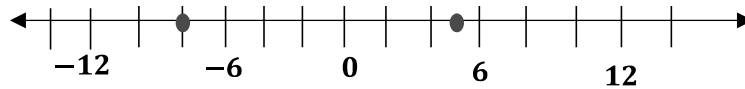
You may use a calculator for this test.

Administered *Month Year*

1) How many even integers are between $\frac{-12}{5}$ and $\frac{21}{5}$?

- A. 2
- B. 8
- C. 4
- D. 6
- E. 5

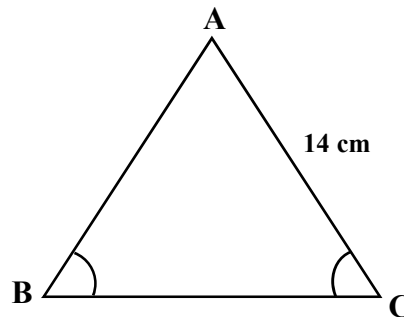
2) Which expression correctly represents the distance between the two points shown on the number line?



- A. $-5 - 8$
- B. $|-8 + 5|$
- C. $-8 + 5$
- D. $-5 + 8$
- E. $|8 + 5|$

3) In the triangle ABC, if angle B and angle C both equal 60° , then what is the length of side BC?

- A. 7 cm
- B. 14 cm
- C. 21 cm
- D. 28 cm
- E. 36 cm



HiSET Practice Test 2

Answers and Explanations

1) Answer: C.

The smallest prime number is 2, and the largest even negative integer is -2 .

$$2 + 4(-2) = 2 - 8 = -6.$$

2) Answer: B.

The difference between his income and his cost is monthly saving.

$$\text{January: } \$4,094 - \$2,342 = \$1,752$$

$$\text{February: } \$4,336 - \$2,822 = \$1,514$$

$$\text{March: } \$4,140 - \$2,922 = \$1,218$$

3) Answer: D.

State the problem in a mathematical sentence:

$$a + 36 = 251 - 4a \rightarrow a + 4a = 251 - 36 \rightarrow 5a = 215 \rightarrow a = 43$$

4) Answer: A.

$$4\frac{4}{15} - 3\frac{1}{3} + 2\frac{2}{5} = (4 - 3 + 2)\frac{4}{15} - \frac{1}{3} + \frac{2}{5} = 3\frac{4}{15} - \frac{5}{15} + \frac{6}{15} = 3\frac{4}{15} + \frac{1}{15} = 3\frac{1}{3}$$

5) Answer: C.

$$2^5 + 2^3 + 2^2 = 32 + 8 + 4 = 44$$

6) Answer: D.

$$\frac{133}{190} = \frac{133}{19} \times \frac{1}{10} = 7 \times \frac{1}{10} = 0.7$$

7) Answer: A.

Use the formula for Percent of Change:

$$\frac{\text{New Value} - \text{Old Value}}{\text{Old Value}} \times 100\% = \frac{43.20 - 40}{40} \times 100\% = \frac{3.20}{40} \times 100\% = 8\%$$

8) Answer: A.

$$|4x - 2| = 10 \rightarrow \begin{cases} 4x - 2 = 10 \rightarrow 4x = 12 \rightarrow x = 3 \\ 4x - 2 = -10 \rightarrow 4x = -8 \rightarrow x = -2 \end{cases}$$

9) Answer: C.

Multiply equation (2) by 3. Add two equations [(1) + 3(2)]:

$$\begin{cases} 4x - 3y = 11 \\ 9x + 3y = 15 \end{cases} \rightarrow 13x = 26 \rightarrow x = 2$$

Substitute $x = 2$ into equation (1): $4(2) - 3y = 11 \rightarrow -3y = 3 \rightarrow y = -1$