

3.1 – 3.2 Worksheet

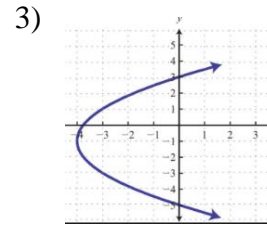
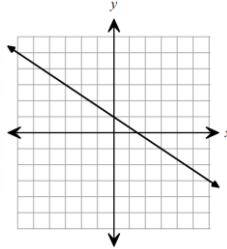
Name: _____ Per ____

LEARNING OBJECTIVES: Students will be able to:

- 1) determine the domain and range of a relation or function in set notation, tables of values, and graphs.
- 2) determine if a relation is a function using sets, tables and graphs including using the vertical line test.
- 3) evaluate functions given an input value
- 4) write a linear function given a table of values

For #1 – 4: Is each relation a function? Remember, a function means every x-value gets paired with exactly one y-value, and you can use the vertical line test when you have graphs.

1) $\{(4,2), (-3,3), (4,1), (-3,3)\}$

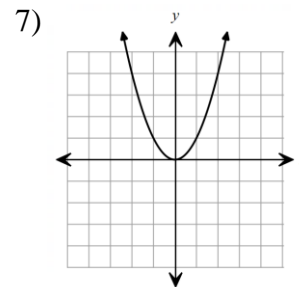
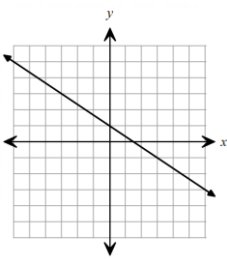


4)

Input	Output
0	0
1	2
4	8
1	2

For #5 – 8: What is the domain of each function shown? At least one of these problems has $x = \text{all real numbers}$ for an answer.

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

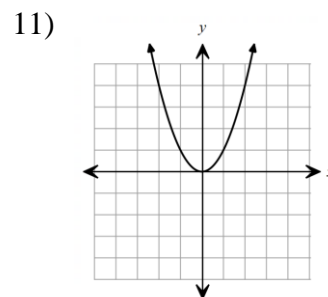
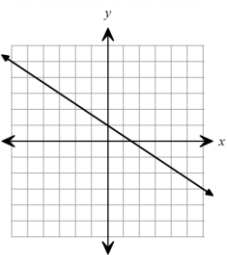


8)

Input	Output
0	0
1	2
4	8
1	2

For #9 – 12: What is the range of each function? Be careful on #11, the answer is NOT $y = \text{all real numbers}$.

9) $\{(4,2), (-3,3), (4,1), (-3,3)\}$



12)

Input	Output
0	0
1	2
4	8
1	2

For #13 – 14, Amy has opened an Etsy store selling earrings. The amount of time she spends making earrings is a function of the amount of time, in hours, that it takes for her to make each pair of earrings. It takes her 3 hours to make each pair of earrings.

13) Which of the following could be the domain (earrings)?

- A) all real numbers
- B) 1, 2, 3, ...
- C) 0, 1, 2, 3, ...
- D) 3, 6, 9, 12, ...

14) Which of the following could be the range (hours)?

- A) all real numbers
- B) 0, 1, 2, 3, ...
- C) 3, 6, 9, 12...
- D) 0, 3, 6, 9, 12, ...

For #15 – 18, $f(x) = -3x + 5$ and $g(x) = 2x + 7$. See 3.2 Notes, examples 1 and 2 for help.

15) Find $f(2)$.

16) Find $g(5)$.

17) Find $g(0)$.

18) Find $f(-6)$.

For #19 – 20: Write a linear function for the data shown in each table. See 3.2 Notes, examples 3 and 4 for help.

19)

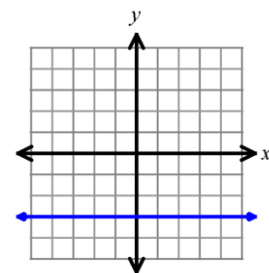
x	-1	0	1	2
$f(x)$	-7	-2	3	8

20)

x	$g(x)$
1	10
2	6
3	2
4	-2

21) Which of the following is the domain and range of the function shown?

- A) D: all real numbers; R: all real numbers
- B) D: all real numbers; R: $y = -3$
- C) D: $x = -2$; R: all real numbers
- D) D: $x = -2$; R: $y = -3$



REVIEW

22) Solve for x :

Don't you DARE forget to distribute that negative!

$$15 - 2(x - 4) = 31$$

23) Solve for w :

$$6 - 3(2 - 4w) + 8w = 12w - 1$$

3.4 Worksheet

Name: _____ Per _____

LEARNING OBJECTIVES: Students will be able to:

- 1) determine if a sequence is arithmetic and find the common difference when appropriate.
- 2) write an equation or function to represent the sequence (recursive = STEM)

For #1 – 3, write the explicit formula for each arithmetic sequence. Use sequence notation: $a_n = dn + a_0$

- 1) 15, 17, 19, 21, ... 2) 3, -1, -5, -9, ... 3) 6, 10, 14, 18, ...

For #4 – 6, write the explicit function for each arithmetic sequence. Use function notation: $f(n) = dn + f(0)$

- 4) 1, 8, 15, 22, ... 5) 9, 4, -1, -6, ... 6) -10, -12, -14, -16, ...

7) Consider the table, which shows the cost of renting a car for various number of days. Which formula below correctly models the cost as an arithmetic sequence?

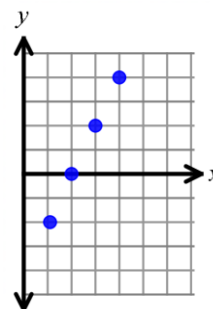
- A) $a_n = 125 + 90n$ B) $a_n = 90n + 35$
C) $a_n = 35n + 90$ D) $a_n = -90n + 125$

# days	Cost (\$)
1	125
2	215
3	305
4	395

8) At a donut factory, there were 8 dozen donuts made during the first hour of operation. Every hour after this, another 40 dozen donuts are made. Write the **explicit formula** representing the number of dozens of donuts at n hours of operation. It may help to start by making a table of values.

9) Which of the following formulas correctly represent the sequence shown by the heights of the points in the graph?

- A) $a_n = 2n - 4$ B) $a_n = -2n - 2$ C) $a_n = 2n - 2$ D) $a_n = -2n + 2$



For #10: After knee surgery, your trainer tells you to return to your jogging program slowly. He suggests jogging for 12 minutes each day for the first week. Each week thereafter, he suggests that you increase that time by 6 minutes per day.

10) Write the explicit formula for this arithmetic sequence. Use function notation.

For #11 – 13, use $h(x) = -2x + 5$; $b(x) = 3x - 11$.

11) Find $h(-7)$.

12) Find $b(0)$.

13) Find $h(2) + b(-1)$

For #14 – 15: Write a linear function for the data shown in each table. See 3.2 Notes, examples 3 and 4 for help.

14)

x	0	1	2	3
$h(x)$	0	-7	-14	-21

15)

x	$d(x)$
1	8
2	5.5
3	3
4	0.5

Literal Equations Review:

16) solve for b :

$$5a + 2b = 40$$

17) Solve for h :

$$V = \frac{1}{3}lwh$$

For #18 – 20, match each recursive arithmetic formula to its correct explicit formula. Not every letter option on the right will be used.

18) $a_1 = 20$; $a_n = a_{n-1} + 17$

A) $a_n = 17 + 15n$

19) $a_1 = 15$; $a_n = a_{n-1} - 5$

B) $a_n = 17n + 3$

C) $a_n = 20 + 17n$

20) $a_1 = 32$; $a_n = a_{n-1} + 15$

D) $a_n = -5n + 20$

E) $a_n = 15n - 5$

For #21 – 23, write the recursive formula for each arithmetic sequence: $a_1 = \underline{\quad}$; $a_n = a_{n-1} + d$

21) 15, 17, 19, 21, ...

22) 3, -1, -5, -9, ...

23) 6, 10, 14, 18, ...

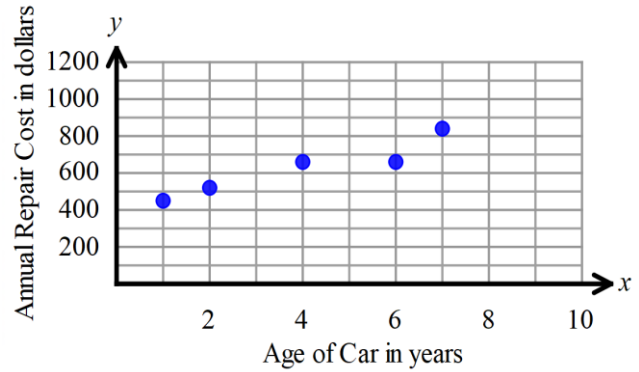
Bonus: An arithmetic sequence has a third term of 26 and a 4th term of 22. Find the explicit formula for this sequence. Use function notation. Making a table of values is always allowed ☺

$$f(n) = dn + f(0)$$

3.5 Worksheet

Name: _____ Per _____

For #1-4: Consider the scatter plot shown comparing the ages of cars and their annual cost of repairs.



1) Describe the correlation (is it positive, negative or none?). Be sure to answer in context of the problem.

2) Draw a line of best fit (also called a trend line). Use two points on your line to find the equation of your line of best fit.

3) Use your trend line to predict the cost of repairs for a car that is 3 years old.

- a) \$200 b) \$400
- c) \$600 d) \$800

4) Use your trend line to predict the cost of repairs for a car that is 8 years old.

- a) \$1,225 b) \$425
- c) \$250 d) \$825

5) Use the table to the right to calculate the average rate of change of $f(x)$ over the intervals from:

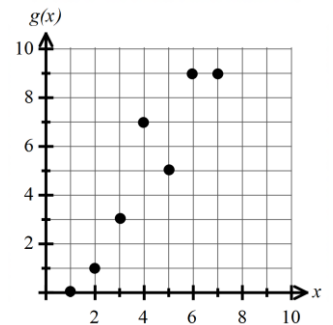
a) $x = 2$ to $x = 5$

x	$f(x)$
1	-3
2	5
4	7
5	10
7	4

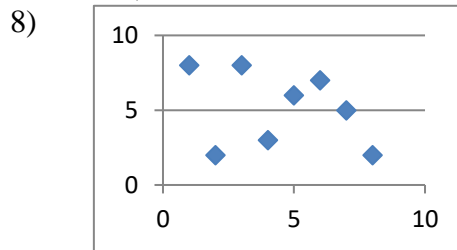
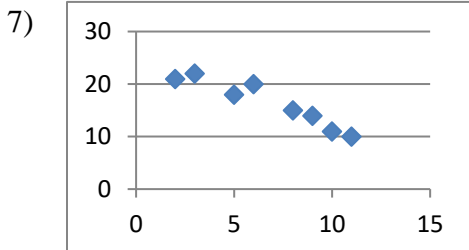
b) $x = 2$ to $x = 7$

c) Is $f(x)$ a linear function? Explain your reasoning.

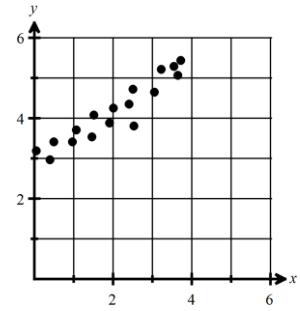
6) Calculate the average rate of change for $g(x)$ over the interval from $x = 2$ to $x = 6$.



For #7-8: Describe the correlation (positive, negative or none).



- 9) Which of the following is a reasonable trend line (line of best fit) for the scatterplot below? To answer this, you may need to draw a trend line and find a reasonable slope and y-intercept.



- A. $y = \frac{1}{3}x + 8$ C. $y = \frac{2}{3}x + 3$
 B. $y = \frac{1}{2}x - 3$ D. $y = 3x + 3$

For #10 – 12: Evaluate the following expressions given the functions $g(x) = -3x + 1$ and $j(x) = 2x + 9$

10) $g(-10)$

11) $j(999)$

12) $g(0)$

For #13 – 14: Write the explicit function for each arithmetic sequence. Use sequence notation: $a_n = dn + a_0$

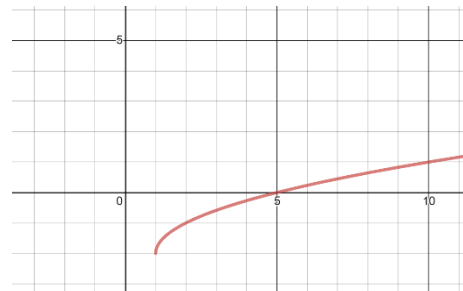
13) 4, -10, -24, ...

14) -6, 19, 44, ...

For #15 – 16: Find the domain and range and state if the relation is a function. See 3.1 notes for help.

15) $\{(4,2), (-3,3), (-4,1), (-2,3)\}$

16)



17) Solve for x: $3(x - 5) = 9x - 21 - 6(x - 1)$

Chapter 3 Practice Test

Name: _____ Per _____

1) Which of the following is an arithmetic sequence?

- A) $-2, -4, -8, -10, -14, -16, \dots$ B) $0, 5, 10, 15, 20, 25, \dots$
 C) $2, 4, 8, 16, 32, \dots$ D) $2, 5, 8, 11, 15, 19, \dots$

For #2 – 4: Write an explicit function for the given sequence.

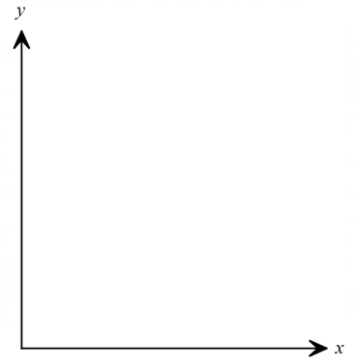
- 2) $15, 8, 1, -6, -13, \dots$ 3) $-3, 2, 7, 12, 17, \dots$ 4) $16, 20, 24, 28, \dots$

For #5 – 9: Each day, Logan practices playing guitar and then does his homework. The data collected is organized in the table.

Homework (# of classes)	1	2	3	4	5
Time (min)	75	105	130	155	180

5) Make a scatter plot of the total time he studies (practices guitar and homework) as a function of the number of classes he has homework in.

Draw a trend line.



6) What type of correlation does the scatter plot in Item 4 show?

- A. positive B. negative C. cannot tell D. none

7) Which of the following equations is the best trend line for the data? Explain your reasoning.

- A $y = -25x + 150$ B. $y = 25x + 150$ C. $y = -25x + 50$ D. $y = 25x + 50$

8) What does the y-intercept of the equation represent?

- A) total time spent studying B) average number of homework assignments
 C) average time spent studying D) time spent practicing guitar

9) Estimate the time it will take Logan to study if he has homework in 6 classes.

For #10 – 15: Given $f(x) = -5x + 3$ and $g(x) = -2x - 3$, find each value.

- 10) $f(2)$ 11) $f(-3)$ 12) $f(5)$

- 13) $g(-2)$ 14) $g(0)$ 15) $g(-4)$

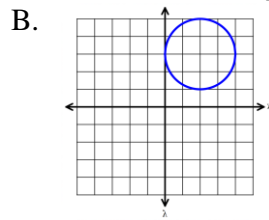
For #16 – 17: Identify the domain and range of the relation.

- 16) $\{(2, 3), (5, 3), (-2, 1), (-3, 2)\}$ 17) $\{(1, 3), (4, 2), (-2, 1), (-3, 5)\}$

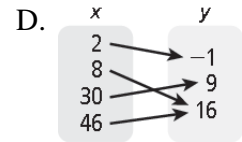
18) Which relation is a function? **Choose all that apply.**

A.

x	y
0	1
2	2
4	4
6	7



C. $\{(1, 2), (3, 4), (1, 5), (4, 6)\}$



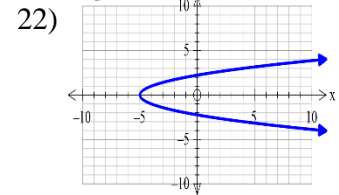
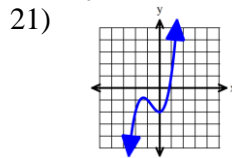
19) Matt works doing yard work around his neighborhood. He earns a set amount for mowing someone's lawn, then an hourly rate for other work like raking leaves. Write a linear function f Matt can use to determine his pay.

Hours	1	2	3	4	5
Pay	22	32	42	52	62

For #20-23: Determine if the relation is a function. **If yes, determine the domain and range.**

20)

x	-4	-9	-4	16	13
y	6	15	5	7	7



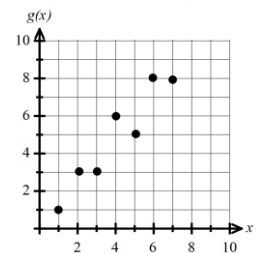
23) $(2, 3), (3, 5), (4, 7), (5, 6)$

For #24 - 25: The functions $f(x)$ and $g(x)$ are shown below. Calculate the average rate of change for each function over the interval from $x = 1$ to $x = 7$.

24) $f(x)$

x	1	2	3	4	5	6	7
$f(x)$	8	10	14	20	28	38	50

25) $g(x)$ (shown to the right)



For #26 - 27: Write a recursive formula for the given sequence.

26) 15, 8, 1, -6, -13, ...

27) -3, 2, 7, 12, 17, ...

28) Given the explicit formula write the recursive formula: $a_n = -3 + 7n$

29) Given the recursive formula write the explicit formula: $a_1 = 5; a_n = a_{n-1} - 2$