Name _____ Date _____

3.1 Practice A

In Exercises 1 and 2, determine whether the relation is a function. Explain.

1.

Input, x	8	4	2	4	8
Output, y	−4	−2	0	2	4

No, 8 and 4 have more than 1 output

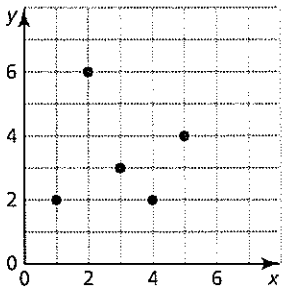
2.

Input, x	0	2	4	6	8
Output, y	3	7	11	15	19

Yes, each input has one output

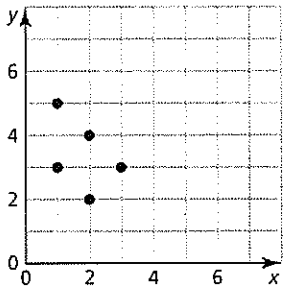
In Exercises 3 and 4, determine whether the graph represents a function. Explain.

3.



Yes, each input has an output

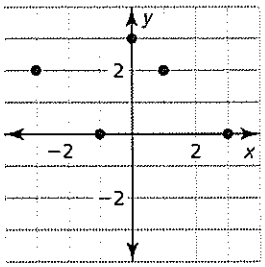
4.



No, it does not pass the VLT.

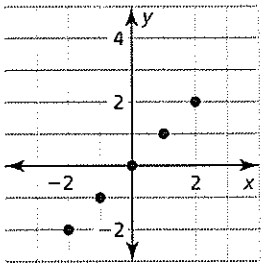
In Exercises 5 and 6, find the domain and range of the function represented by the graph.

5.



D: −3, −1, 0, 1, 3
R: 0, 2, 3

6.



D: −2, −1, 0, 1, 2
R: −2, −1, 0, 1, 2

7. The function $y = 7x + 35$ represents the monthly cost y (in dollars) of a group of x members joining the fitness club.

   a. Identify the independent and dependent variables.
   Independent: x members Dependent: cost y

   b. Your group has enough money for up to six members to join the fitness club. Find the domain and range of the function.
   D: 0, 1, 2, 3, 4, 5, 6
   R: 42, 49, 56, 63, 70, 77
   Plug the domain into equation →

In Exercises 8 and 9, determine whether the statement uses the word *function* in a way that is mathematically correct. Explain your reasoning.

8. A function pairs each teacher with 30 students.
   No, the teacher has 30 students so it has more than 1 output.

9. The cost of mailing the package is a function of the weight of the package.
   Yes, each weight has one cost.

Name_____ Date_____

3.1 Practice B

In Exercises 1 and 2, determine whether the relation is a function. Explain.

1.

Input, x	0	1	3	2	1
Output, y	1	5	10	15	20

Not a function, the input of 1 has more than 1 output.

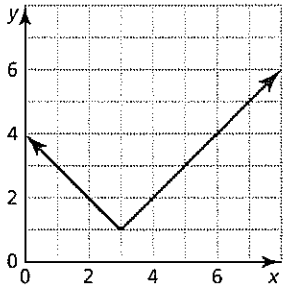
2.

Input, x	0	1	2	3	4
Output, y	−14	−7	0	7	14

Function, each input has an output.

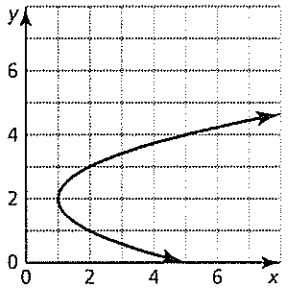
In Exercises 3 and 4, determine whether the graph represents a function. Explain.

3.



Yes, it passes the vertical line test.

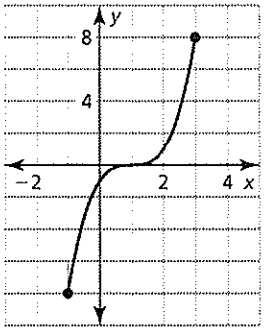
4.



No, it fails the vertical line test.

In Exercises 5 and 6, find the domain and range of the function represented by the graph.

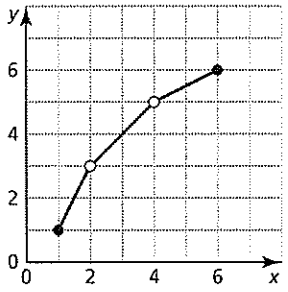
5.



D: $-1 \leq x \leq 3$

R: $-8 \leq y \leq 8$

6.



D: $-1 \leq x < 2$, $2 < x < 4$, $4 < x \leq 6$

R: $1 \leq y < 3$, $3 \leq y < 5$, $5 < y \leq 6$

7. The function $2x + 1.5y = 18$ represents the number of book raffle tickets x and food raffle tickets y you buy at a club event.

a. Solve the equation for y.

$2x + 1.5y = 18$

$-2x \quad -2x$

$\frac{1.5y}{1.5} = \frac{-2x + 18}{1.5}$

$y = -1.3x + 12$

b. Make an input-output table to find ordered pairs for the function.

x	0	3	6	9
y	12	8	4	0

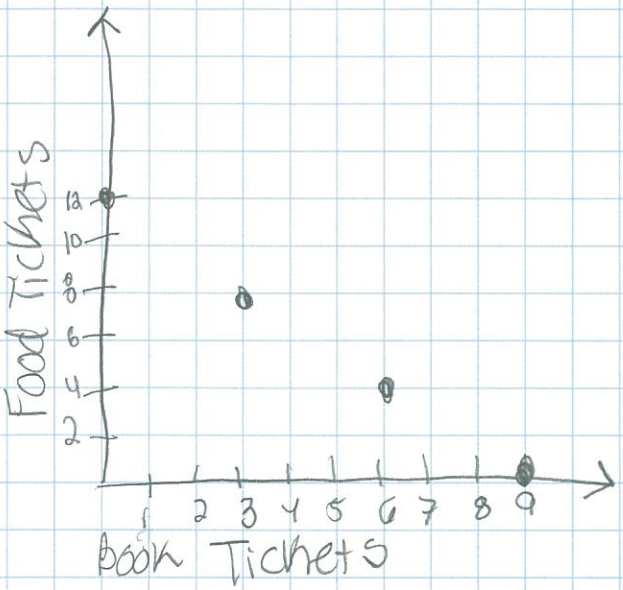
c. Plot the ordered pairs in a coordinate plane. (see graph on next page)

In Exercises 8–10, find the domain and range of the function.

8. $y = |x| + 2$

9. $y = -|x| + 1$

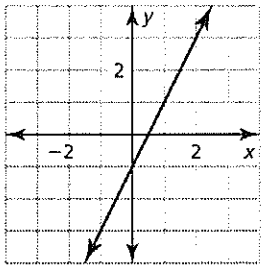
10. $y = -|x| - 3$


Food Tickets
12
10
8
6
4
2
1 2 3 4 5 6 7 8 9
Book Tickets

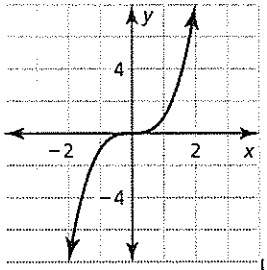
Name * This was the optional W.S. It was due Monday. Date

3.2 Practice A

In Exercises 1 and 2, determine whether the graph represents a *linear* or *nonlinear* function. Explain.

1. 

Linear, it is a straight line

2. 

Nonlinear, it is not a straight line.

In Exercises 3 and 4, determine whether the table represents a *linear* or *nonlinear* function. Explain.

3.

x	0	1	2	3
y	3	5	7	9

Linear, there is a constant rate of change.

4.

x	1	4	7	10
y	2	5	6	10

Nonlinear, there is not a constant rate of change.

In Exercises 5–8, determine whether the equation represents a *linear* or *nonlinear* function. Explain.

5. $y = \sqrt{x} + 5$ Nonlinear, does not have a $\sqrt{x}$.

6. $y = 4x - 2$ Linear, it can be written in $y = mx + b$ form

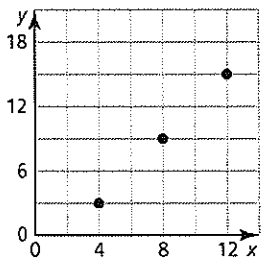
7. $y = 9 - x$ Linear, it can be written in $y = mx + b$ form

8. $y = (x - 1)(x + 7)$ Nonlinear, you would have an x^2 which forms a curved line.

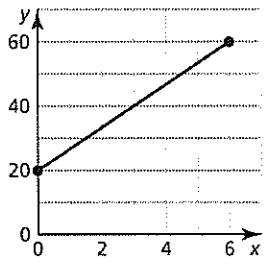
9. Fill in the table so it represents a linear function.

x	4	8	12	16	20
y	−4	0	4	8	12

In Exercises 10 and 11, find the domain of the function represented by the graph. Determine whether the domain is *discrete* or *continuous*. Explain.

10. 

D: 4, 8, 12 Discrete because there are only whole numbers.

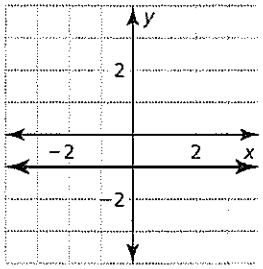
11. 

D: $0 \leq x \leq 6$ Continuous, the x can be any # between 0 and 6

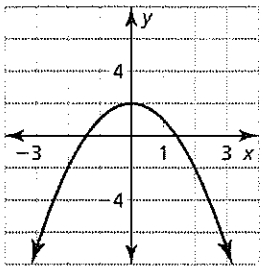
Name _____ Date _____

3.2 Practice B

In Exercises 1 and 2, determine whether the graph represents a *linear* or *nonlinear* function. Explain.

1. 

Linear, it is a straight line.

2. 

Nonlinear, it is not a straight line.

In Exercises 3 and 4, determine whether the table represents a *linear* or *nonlinear* function. Explain.

3.

x	0	2	4	6
y	3	9	27	81

+2 +2 +2
+6 +18 +74
Nonlinear, there is no choc.

4.

x	14	24	34	44
y	24	20	16	12

+10 +10 +10
−4 −4 −4
Linear, there is a choc.

In Exercises 5–8, determine whether the equation represents a *linear* or *nonlinear* function. Explain.

5. $y - \frac{1}{3}x = 4x - 7$
Linear, it can be written in y=mx+b

6. $6 - \frac{2}{5}x = 3y + 8x$
Linear, it can be written in y=mx+b

7. $(y + 2)(y - 4) = 3x$
Nonlinear, you would have an x^2.

8. $4x - 5y + 2xy = 0$
Nonlinear, when you reorange it, you'd have a variable in the denominato and that's not y=mx+b form.

In Exercises 9 and 10, determine whether the domain is *discrete* or *continuous*. Explain.

9.

Input Months, x	1	2	3
Output Height of basil plant (inches), y	3	7	11

continuous, you can have 1/2 a month.

10.

Input Tickets, x	10	20	30
Output Cost (dollars), y	60	120	180

Discrete, you can not have 1/2 a ticket.

Name Hey ü Date

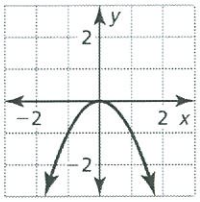
3.2 Puzzle Time

What Do You Get When You Cross A Tortoise And A Porcupine?

Write the letter of each answer in the box containing the exercise number.

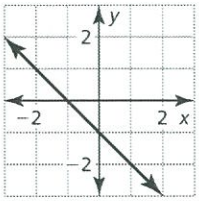
Determine whether the graph, table, or equation represents a linear or nonlinear function.

1.



D. linear **E.** nonlinear

2.



O. linear **P.** nonlinear

3.

x	2	4	6	8
y	21	18	15	12

A. linear **B.** nonlinear

4.

x	−13	−9	−5	−1
y	27	30	27	22

N. linear **O.** nonlinear

5. $y = \frac{1}{7}(x - 28) + 16$

W. linear **X.** nonlinear

6. $y = -2x^2 + 7$ * No exponents allowed

K. linear **L.** nonlinear

7. $y = 14 - \frac{1}{5}x$

P. linear **Q.** nonlinear

8. $3 - \frac{1}{9}y = 8x - 11$ * can be reorganized into y=mx+b

K. linear **L.** nonlinear

9. The function $y = 16 + 0.75x$ represents the cost y (in dollars) of a large pizza with x extra toppings.

S. linear **T.** nonlinear

3		9	6	2	5	7	4	8	1
A		S	L	O	W	P	O	K	E

Hana ü

3.3 Practice A

1. $f(-2) = -5$; $f(0) = -3$; $f(5) = 2$

2. $g(-2) = 4$; $g(0) = 0$; $g(5) = -10$

3. $h(-2) = 11$; $h(0) = 5$; $h(5) = -10$

4. **a.** The number of customers at 8 A.M. was 10.

   b. The number of customers at 2 P.M. was the same as the number of customers at 3 P.M.

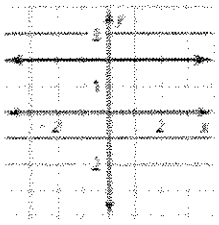
   c. There was a time when there were no customers in the department store.

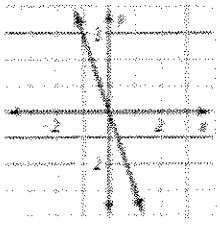
   d. There were more customers at noon than at 11 A.M.

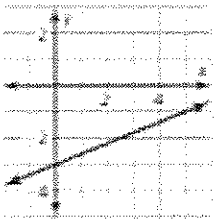
5. -4 6. -1.5 7. 3 8. 2

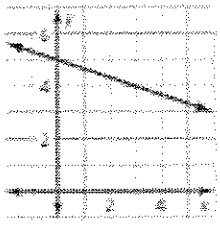
9. 3 10. 4

11. **a.** $228.50 **b.** 10 months

12. 

13. 

14. 

15. 

16. **a.** $(-2, 7)$ **b.** $(2, 4)$

3.3 Practice B

1. $f(-2) = -2$; $f(0) = 1$; $f(5) = 8.5$

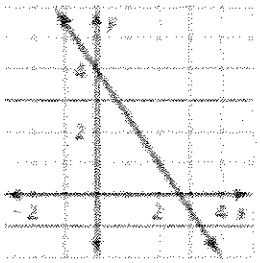
2. $g(-2) = 19$; $g(0) = 13$; $g(5) = -2$

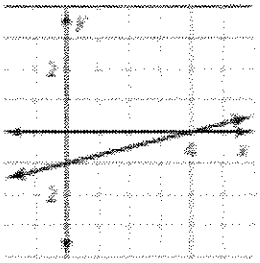
3. $h(-2) = -3$; $h(0) = -5$; $h(5) = -10$

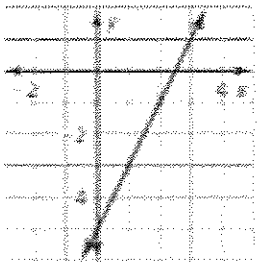
4. a. All (or 100%) of your friends had a landline phone in 2000.
   b. The percentage of your friends with a landline phone was the same in 2005 as it was in 2006.
   c. m% of your friends had a landline phone in 2010.
   d. The percentage of your friends with a landline phone was greater in 2011 than it was in 2012.

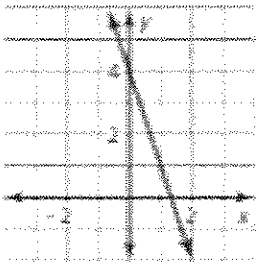
5. 3 6. -5 7. 30 8. 12

9. 5 10. 5

11. 

12. 

13. 

14. 

15. either one; They both charge $250 for 5 hours of labor.