

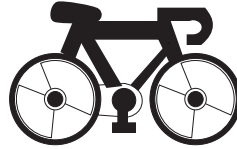
# Relations and Functions

## LESSON ONE - *Graphing Relations*

### Lesson Notes

**Introduction** Caitlin rides her bike to school every day. The table of values below shows her distance from home as time passes.

a) Write a sentence that describes this relation.



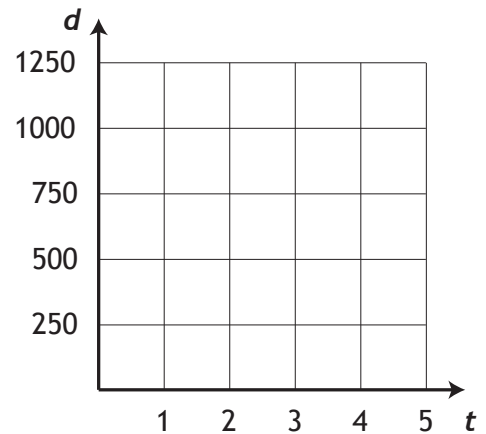
time (minutes)	distance (metres)
0	0
1	250
2	500
3	750
4	1000
5	1250

b) Represent this relation with ordered pairs.

c) Represent this relation with an arrow diagram.

d) Write an equation for this scenario.

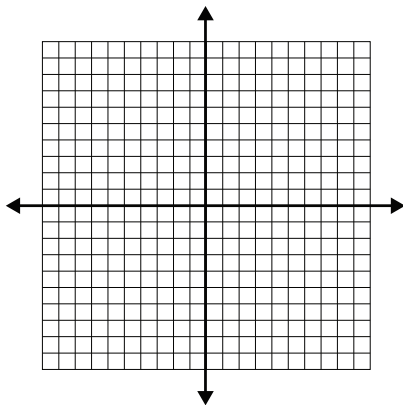
e) Graph the relation.



**Example 1** For each relation, complete the table of values and draw the graph.

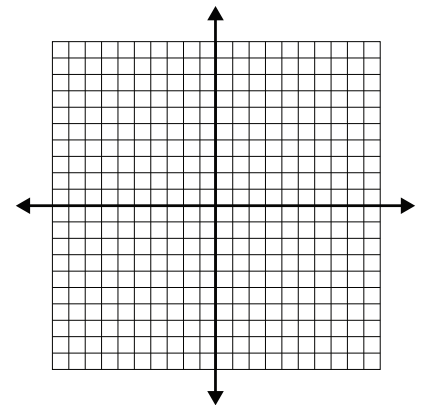
a)  $y = -2x + 3$

x	y
-2	
-1	
0	
1	
2	



b)  $y = x$

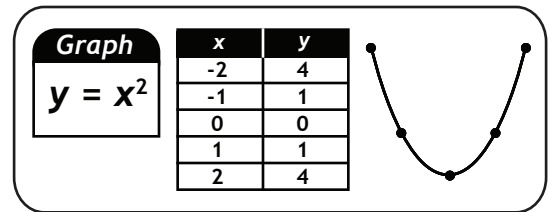
x	y
-2	
-1	
0	
1	
2	



# Relations and Functions

## LESSON ONE - Graphing Relations

### Lesson Notes

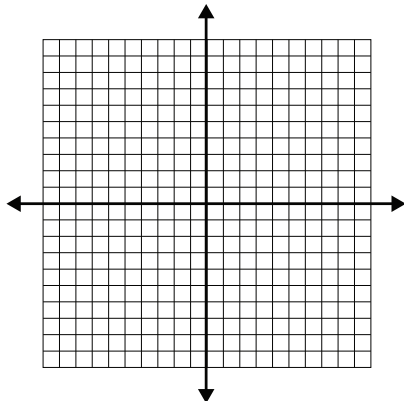


### Example 2

For each relation, complete the table of values and draw the graph. State if the relation is linear or non-linear.

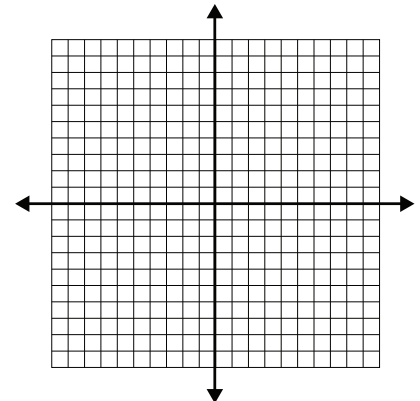
a)  $y = x^2$

x	y
-2	
-1	
0	
1	
2	



b)  $y = \frac{1}{2}x + 1$

x	y
-4	
-2	
0	
2	
4	



### Example 3

For each scenario, state the dependent variable, the independent variable, and the rate. Write the equation.

a) A fruit vendor generates a revenue of  $R$  dollars by selling  $n$  boxes of plums at \$3 each.

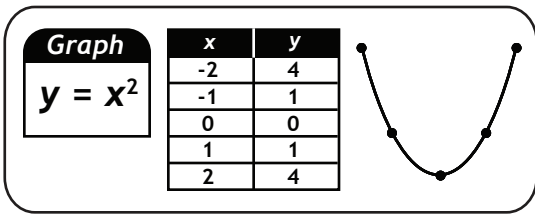
- i) the dependent variable is \_\_\_\_\_.
- ii) the independent variable is \_\_\_\_\_.
- iii) the rate is \_\_\_\_\_.
- iv) the equation is \_\_\_\_\_.

b) A runner with a speed of 9 m/s can run  $d$  metres in  $t$  seconds.

- i) the dependent variable is \_\_\_\_\_.
- ii) the independent variable is \_\_\_\_\_.
- iii) the rate is \_\_\_\_\_.
- iv) the equation is \_\_\_\_\_.

c) A diver experiences a pressure of  $P$  kilopascals at a depth of  $d$  metres. Underwater pressure increases at 10 kilopascals/metre.

- i) the dependent variable is \_\_\_\_\_.
- ii) the independent variable is \_\_\_\_\_.
- iii) the rate is \_\_\_\_\_.
- iv) the equation is \_\_\_\_\_.



# Relations and Functions

## LESSON ONE - Graphing Relations

### Lesson Notes

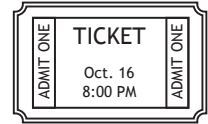
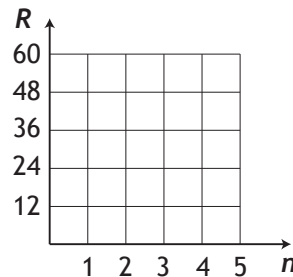
### Example 4

Tickets to a concert cost \$12 each. The revenue from ticket sales is  $R$ , and the number of tickets sold is  $n$ .

- a) Write an equation for this scenario.
- b) Generate a table of values.

$n$	$R$

- c) Draw the graph.



- d) Is the relation continuous or discrete?

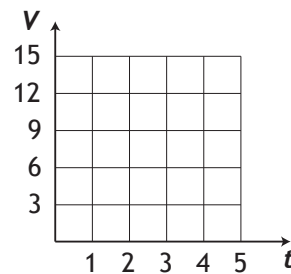
### Example 5

A cylindrical tank is being filled with water at a rate of 3 L/min. The volume of water in the tank is  $V$ , and the elapsed time is  $t$ .

- a) Write an equation for this scenario.
- b) Generate a table of values.

$t$	$V$

- c) Draw the graph.



- d) Is the relation continuous or discrete?

### Example 6

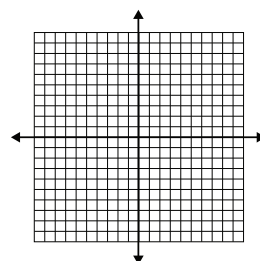
A relation is represented by  $4x + 2y = 8$ .

- a) Isolate  $y$  so this relation can be graphed.

- b) Generate a table of values.

$x$	$y$

- c) Draw the graph.

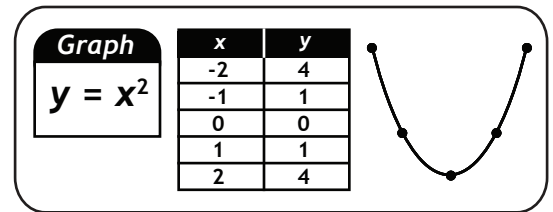


- d) Is the relation continuous or discrete?

# Relations and Functions

## LESSON ONE - *Graphing Relations*

### Lesson Notes



### Example 7

Nick, a salesman, earns a base salary of \$600/week plus an 8% commission on sales. The amount of money Nick earns in a week is  $E$ , and the total value of his sales is  $s$ .

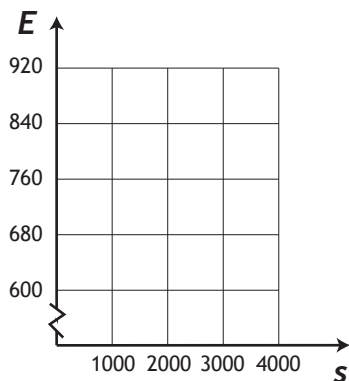


a) Write an equation that relates the variables.

b) Complete the table of values.

$s$	$E$
0	
1000	
2000	
3000	
4000	

c) Draw the graph.



d) Is this relation linear or non-linear?

e) Is this relation discrete or continuous?

f) What are the dependent and independent variables?

g) If Nick makes \$6200 in sales one week, what will his earnings be?

h) How much will Nick have to sell if he makes \$1560 in one week?