Math 10

Lesson 3-8 Answers

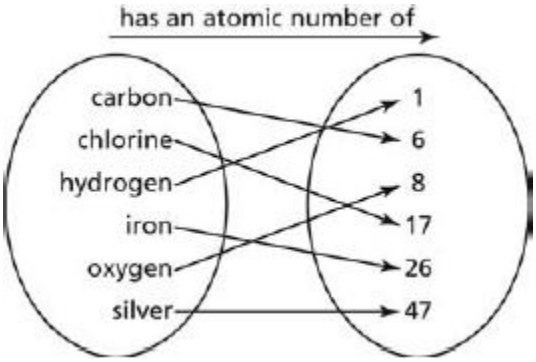
Assignment

2. Representations may vary. For example:

a) As a table:

Element	Atomic Number
carbon	6
chlorine	17
hydrogen	1
iron	26
oxygen	8
silver	47

As an arrow diagram:

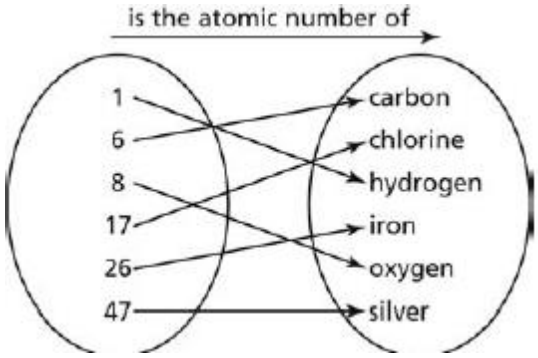


As a set of ordered pairs:
{(carbon, 6), (chlorine, 17), (hydrogen, 1), (iron, 26),(oxygen, 8), (silver, 47)}

b) As a table:

Atomic Number	Element
1	hydrogen
6	carbon
8	oxygen
17	chlorine
26	iron
47	silver

As an arrow diagram:



As a set of ordered pairs:
{(1, hydrogen), (6, carbon), (8, oxygen), (17, chlorine), (26, iron), (47, silver)}

3. a) Not a function
   b) Function
   c) Function
   d) Not a function

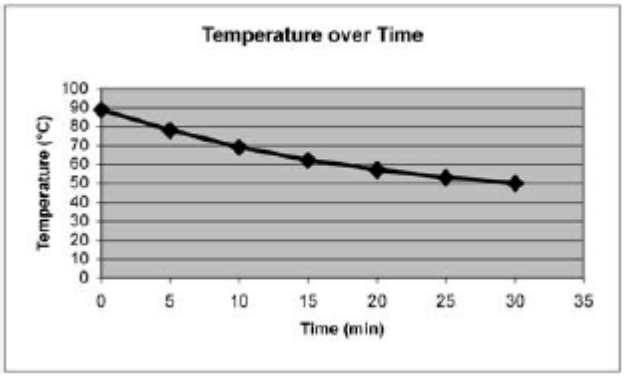
4. a) $f(x) = -4x + 9$
   b) $C(n) = 12n + 75$
   c) $D(t) = -20t + 150$
   d) $P(s) = 4s$

5. a) $P = 5n - 300$
   b) Independent variable: n; dependent variable: P
   c) $P(150) = 450$; if 150 students attend the dance, the profit is \$450.
   d) $n = 200$; the profit is \$700 when 200 students attend the dance.

6. a) Graph A
   b) Answers may vary. For example:
   Graph D could represent Laura's journey to school to pick up her bike. She walks to school, then picks up her bicycle and rides home.

7. b) 2 times
   c) 2.0 L of water
   d) Dependent variable: volume of water in Liam's flask; independent variable: distance Liam hikes

8. a) I joined the points because all times between 0 min and 30 min are permissible and all temperatures between 50°C and 89°C are permissible.



   b) The graph represents a function because a vertical line drawn on the graph passes through one point.

9. Estimates may vary.
   a) Not a function; domain: {13, 14, 15, 16, 17}; range: {159, 161, 165, 168, 170, 174, 176}
   b) Function; domain: {08:00, 10:00, 12:00, 14:00, 16:00, 18:00}; range: {2, 5, 10, 20, 25}

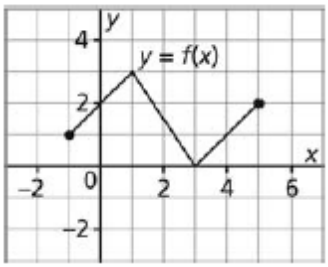
10. a)
   i) Graph A represents the volume of a jar, in cubic centimetres, as a linear function of its height, in centimetres.
   ii) Graph B represents the number of marbles in a jar as a linear function of the jar's height, in centimetres.
   b)
   i) Independent variable: height of the jar, h; dependent variable: volume of the jar, V
   ii) Independent variable: height of the jar, h; dependent variable: number of marbles in the jar, n
   c)
   i) Estimates may vary. For example:
   Domain: $5 \leq h \leq 20$; range: approximately $400 \leq V \leq 1575$
   ii) Domain: {5, 10, 15, 20}; range: {14, 28, 42, 56}

d) The points are joined in Graph A because it is possible for a jar to have any height between 5 cm and 20 cm and any volume between 400 cm^3 and 1575 cm^3. The points are not joined in Graph B because only whole numbers of marbles are permissible.

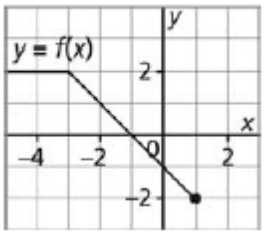
11. a) –2 b) –1

12. Graphs may vary. For example:

a)



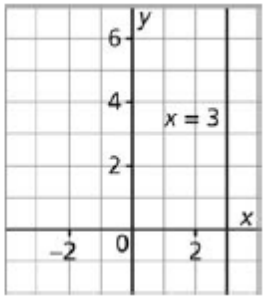
b)



13. a) Linear relation b) Linear relation c) Not a linear relation

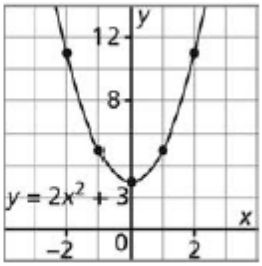
14. Tables of values may vary. For example:

a) i)



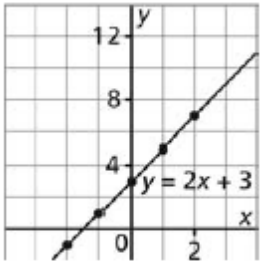
ii) Table:

x	y
–2	11
–1	5
0	3
1	5
2	11

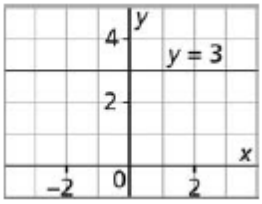


iii)

x	y
–2	–1
–1	1
0	3
1	5
2	7

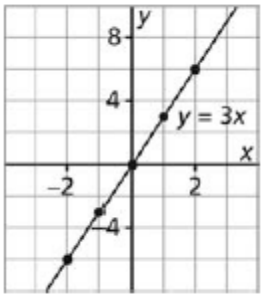


iv)



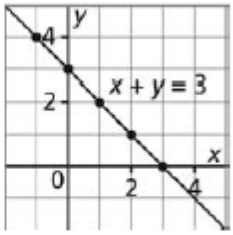
v)

x	y
–2	–6
–1	–3
0	0
1	3
2	6



vi)

x	y
–1	4
0	3
1	2
2	1
3	0



b) i, iii, iv, v, vi

15.

a) The equation represents a linear relation because, when g changes by 1, N changes by $\frac{1}{15}$.

b) $\frac{1}{15}$; For every 1 g of carbohydrate that Isabelle consumes, she gives herself $\frac{1}{15}$ of a unit of insulin.

16.

a) 6000 m, or 6 km
b) Domain: $0 \leq n \leq 2800$; range: $0 \leq d \leq 6000$
c) Approximately 2.1 m/revolution; in one revolution of the wheel, the bicycle covers a distance of approximately 2 m.
d) Approximately 0.68 m, or 68 cm

17. a) ii b) iii c) i

18.

a) 201 caps
b) $4
c) i) 350 caps ii) 500 caps
d) The profit depends on the sale of caps and the initial cost of $800 to buy or make the caps. So, doubling the number of caps does not double the profit.