# Unit 4 – Review

1. Given the table of values:

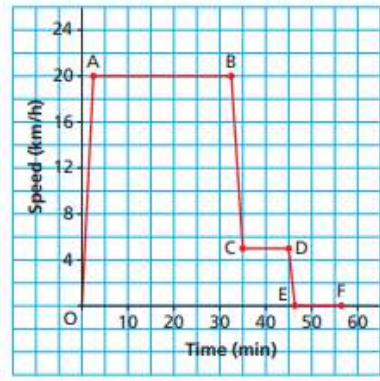| $x$ | $y$ |
|---|---|
| 4 | $-4$ |
| 5 | 7 |
| 8 | 13 |
| 5 | 1 |

a) Represent this relation as a set of ordered pairs.

b) Is the relation a function? Justify your answer.

2. For each relation state the independent and dependent variables.

a)

| $r$ | $A$ |
|---|---|
| 1 | 3.14 |
| 2 | 12.57 |
| 3 | 28.27 |
| 4 | 50.27 |

b)



c) $d = -4.9t^2$

d) $y = \sqrt{x} + 4$

3. Which relations are linear?

a) $y = x^2 + 9x - 1$

b) $2x - 6y + 5 = 0$

c) $x + x^{-1} + 1 = 0$

d) $y - 2 = \frac{1}{3}(x + 1)$

e) $x^2 + y^3 = 4$

4. Which relations are linear functions ?

a)

| $x$ | $y$ |
|---|---|
| 4 | $-35$ |
| 5 | $-42$ |
| 6 | $-49$ |
| 7 | $-56$ |

b)

| $x$ | $y$ |
|---|---|
| 26 | 42 |
| 23 | 46 |
| 20 | 50 |
| 17 | 56 |

c) $\{ (2,1), (2,2), (3,1), (3,2) \}$

5. Write each equation in function notation.

a) $y = -4x + 9$

b) $C = 12n + 75$

c) $D = 150 - 20n$

d) $B = 3V$

6. Given $f(x) = 4x - 10$;

a) Determine $f(3)$

b) Determine the value of $x$ when $f(x) = 42$.

7. Given the function $f(x) = -5x + 3$; determine:

a) $f(2)$

b) $f(-5)$

c) $f(0)$

8. Given the function $f(x) = 2 + 3x$; determine the value of $x$ when :
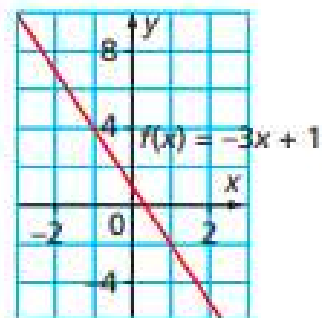
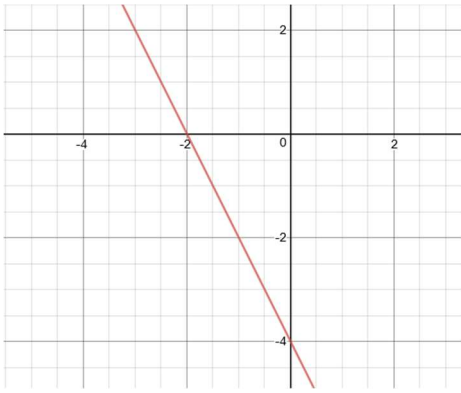a) $f(x) = 11$

b) $f(x) = 32$

c) $f(x) = -10$

9. Given the graph of the function $f(x) = -3x + 1$.

a) Determine the value of the range associated with the value 1 of the domain.



b) Determines the value of the domain associated with the value 4 of the range.

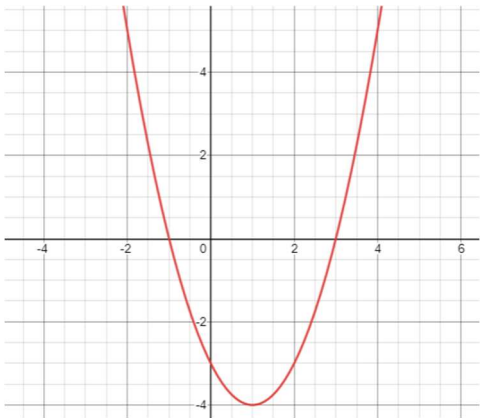10. Given the graph of the function $f(x)$. Determine:



a) $f(-2) =$ _____

b) $f(0) =$ _____

c) $x =$ _____ when $f(x) = 2$

11. Given the graph of the function $f(x)$. Determine :



a) $f(-2) =$ _____

b) $f(0) =$ _____

c) $x =$ _____ when $f(x) = 0$

d) $x =$ _____ when $f(x) = -4$

12. Sketch the graphic of a relation that has the specified domain and range.

a) domain : $-1 \leq x \leq 5$ ; range : $0 \leq y \leq 3$



b) domain : $x \leq 1$ ; range: $-2 \leq y \leq 2$
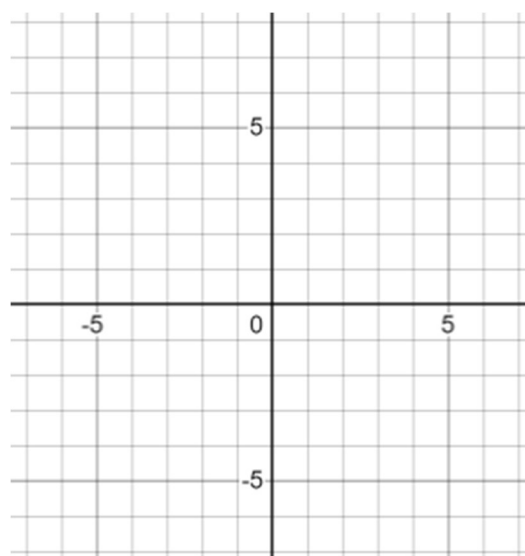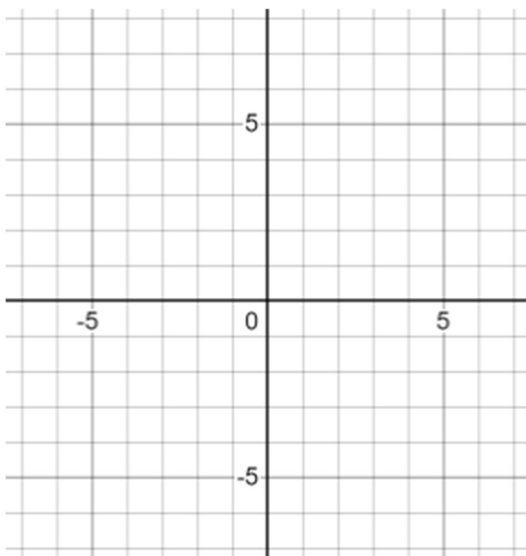
13. The function $P(n) = 5n - 300$ describes the profit, P, in dollars, of a dance in which n students attended.

a) Identify the independent and dependent variables

b) Determine the value of $P(150)$. What does this number represent?

c) Determine the value of $n$ when $P(n) = 700$. What does the number represent ?

14. The equation $V(d) = -0.08d + 50$ defines the volume of gasoline, V, in litres, that remains in a vehicle's tank after a journey of d kilometres. The tank must be emptied before refueling.

a) Determine the value of $V(600)$. What does the number represent ?

b) Determine the value of $V(d) = 26$. What does the number represent ?

15. Determine the domain and range of each relation. Write them in set and interval notation. Determine if the relation is a function.
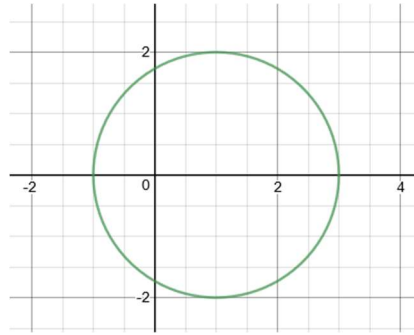
a)
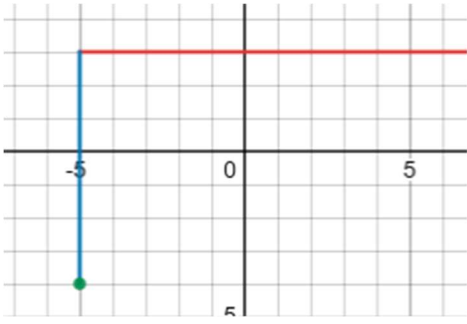
|  | Set Notation | Interval Notation |
|---|---|---|
| Domain : | _____ | _____ |
| Range : | _____ | _____ |
| Function : | Yes | No |

b)

|  | Set Notation | Interval Notation |
|---|---|---|
| Domain : | _____ | _____ |
| Range : | _____ | _____ |
| Function : | Yes | No |

c)
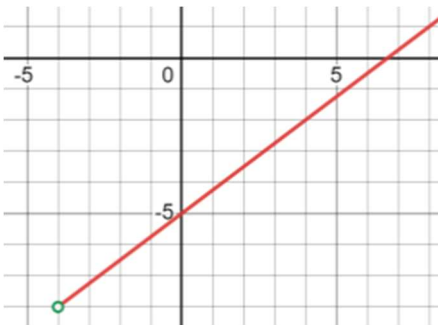
|  | Set Notation | Interval Notation |
|---|---|---|
| Domain : | _____ | _____ |
| Range : | _____ | _____ |
| Function : | Yes | No |

d)
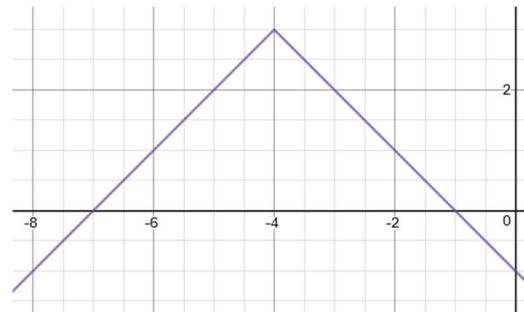
|  | Set Notation | Interval Notation |
|---|---|---|
| Domain : | _____ | _____ |
| Range : | _____ | _____ |
| Function : | Yes | No |

e)
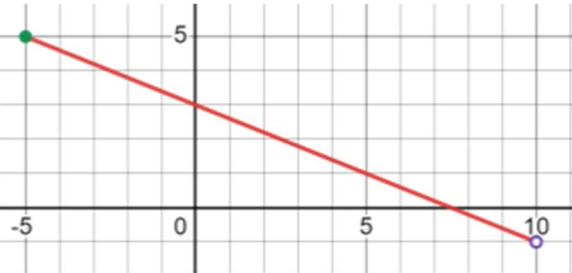
|  | Set Notation | Interval Notation |
|---|---|---|
| Domain : | _____ | _____ |
| Range : | _____ | _____ |
| Function : | Yes | No |

f)
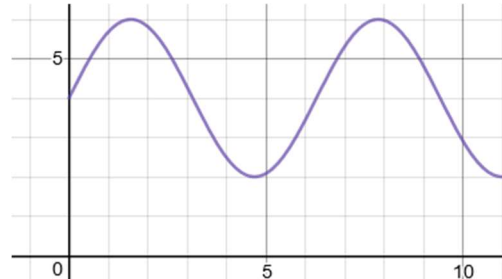
|  | Set Notation | Interval Notation |
|---|---|---|
| Domain : | _____ | _____ |
| Range : | _____ | _____ |
| Function : | Yes | No |
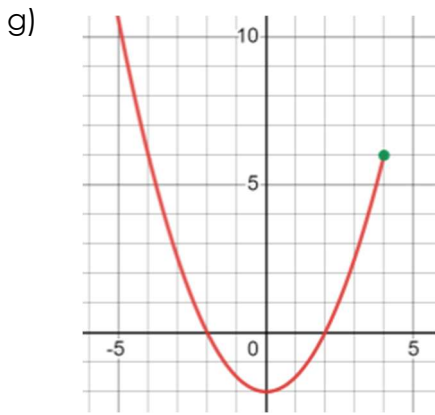
g)



|  | Set Notation | Interval Notation |
|---|---|---|
| Domain : | _____ | _____ |
| Range : | _____ | _____ |
| Function : | Yes | No |

h)
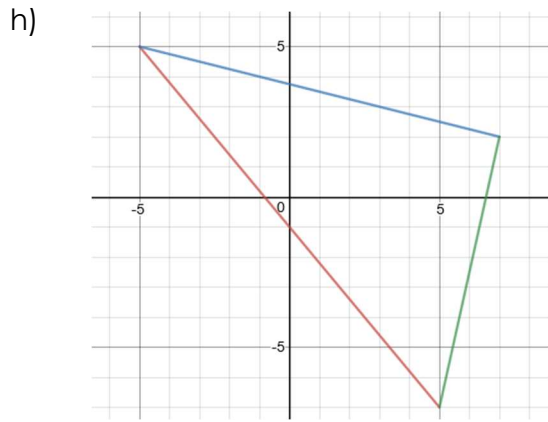


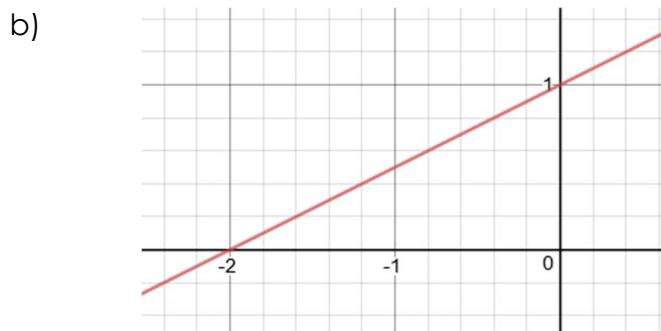|  | Set Notation | Interval Notation |
|---|---|---|
| Domain : | _____ | _____ |
| Range : | _____ | _____ |
| Function : | Yes | No |

16. Determine the coordinates for the intercepts.

a)



x-intercept: _____

y-intercept: _____

b)
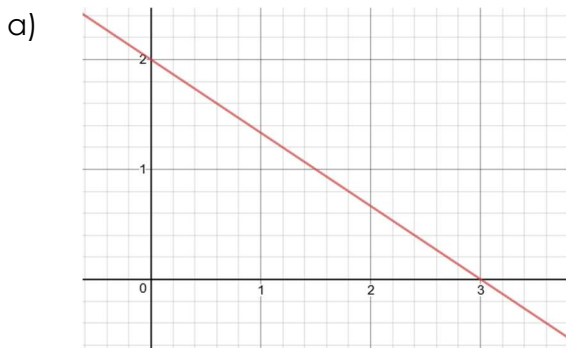


x-intercept: _____

y-intercept: _____

c) $4x + 3y = 18$

x-intercept: _____

y-intercept: _____
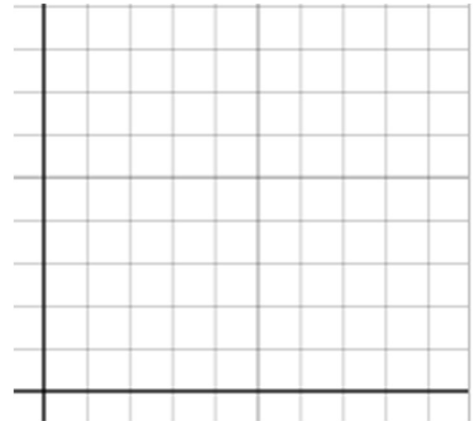
d) $2x - 7y = -28$

x-intercept: _____

y-intercept: _____

17. The data below show how the temperature of boiling water as it cools related to time.

a) Graph the data.  Did you join the points ?  Why?

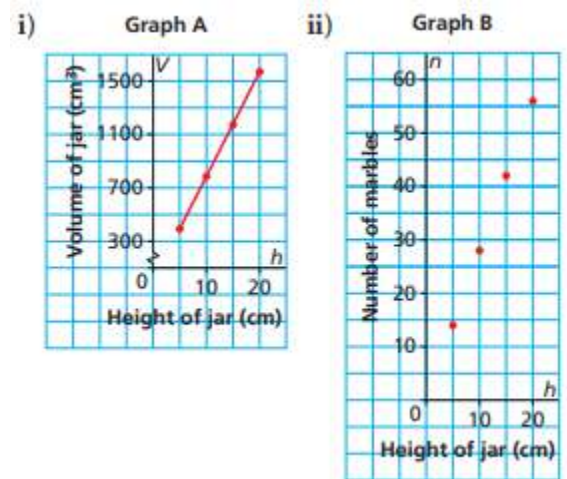| Time (min) | Temperature (°C) |
|---|---|
| 0 | 89 |
| 5 | 78 |
| 10 | 69 |
| 15 | 62 |
| 20 | 57 |
| 25 | 53 |
| 30 | 50 |

b) Does the graph represent a function ?  How can you tell ?

18.  Given the graphs

a) What does each graph represent ?

i) Graph A

ii) Graph B

b) Identify the independent and dependent variables.

c) Find the domain and range for each graph.  Estimate where necessary.  Are there any restrictions on the domain and range?  Why?
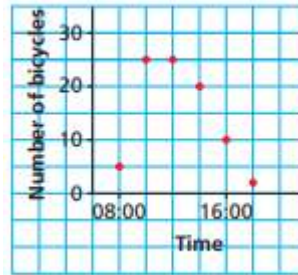
d) Why are the points joined on one graph but not on the other?

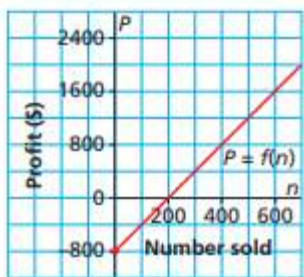19. Which graph represents a function ?  Find the domain and range for each graph.  Estimate if necessary.

a)  **Heights and Ages of 8 Students**
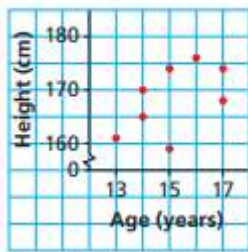
b)  **Number of Bicycles at School**

20. The graph shows the profit, $P$ dollars, on the sale of $n$ baseball caps.

a)  How many baseball caps have to be sold before the company make a profit?

b) What is the profit on each baseball cap ?
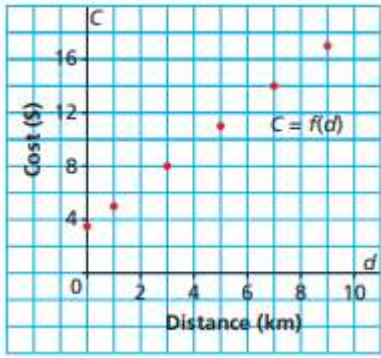
c) How many caps need to be sold to make each profit :
    i)  $600 ?                                    ii)  $1200 ?

d) In part c) , when the profit doubles why does the number of baseball caps sold not double?

21. This graph shows the cost for a cab at Eagle Taxi Cabs. The cost, $C$, in dollars, is a function of the distance, $d$, in kilometres.



a) Determine the rate of change. What does it represent?

b) What is the cost when the distance is $7 \ km$ ?

c) What is the distance when the cost is $\$ 9.50$ ?

22. The table represents the relationship between the altitude in meters, A, of an aircraft and the time in minutes, t minutes, elapsed since the beginning of the descent.

| $t \ (min)$ | $A \ (m)$ |
|---|---|
| 0 | 9600 |
| 2 | 8200 |
| 4 | 6800 |
| 6 | 5400 |
| 8 | 4000 |

a) Determines whether the relationship is linear from the value table. Justify your answer.

b) Determines the rate of change.