

# ESSENTIAL MATHEMATICS 3

## WEEK 15 NOTES AND EXERCISES

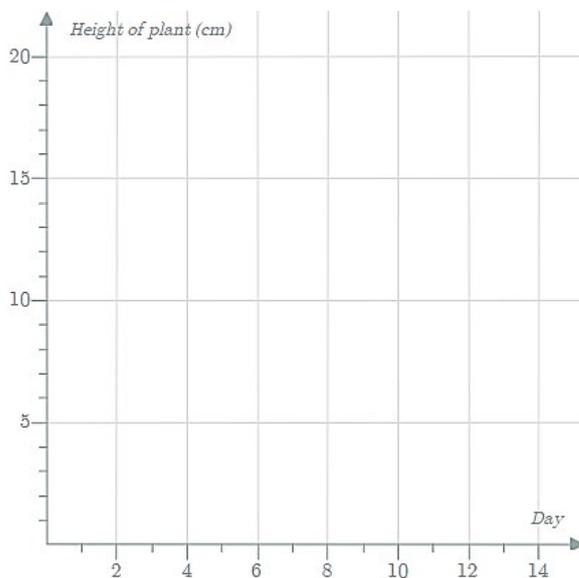
### Linear Modelling (continued)

#### Exercise 1

Q1. Sam is collecting data on the growth of her plants. The table shows the data she has collected so far

Day ( $d$ )	2	4	6	8	10
Height of plant ( $h$ cm)	5	7	9	11	13

a) Draw this linear function on the graph below

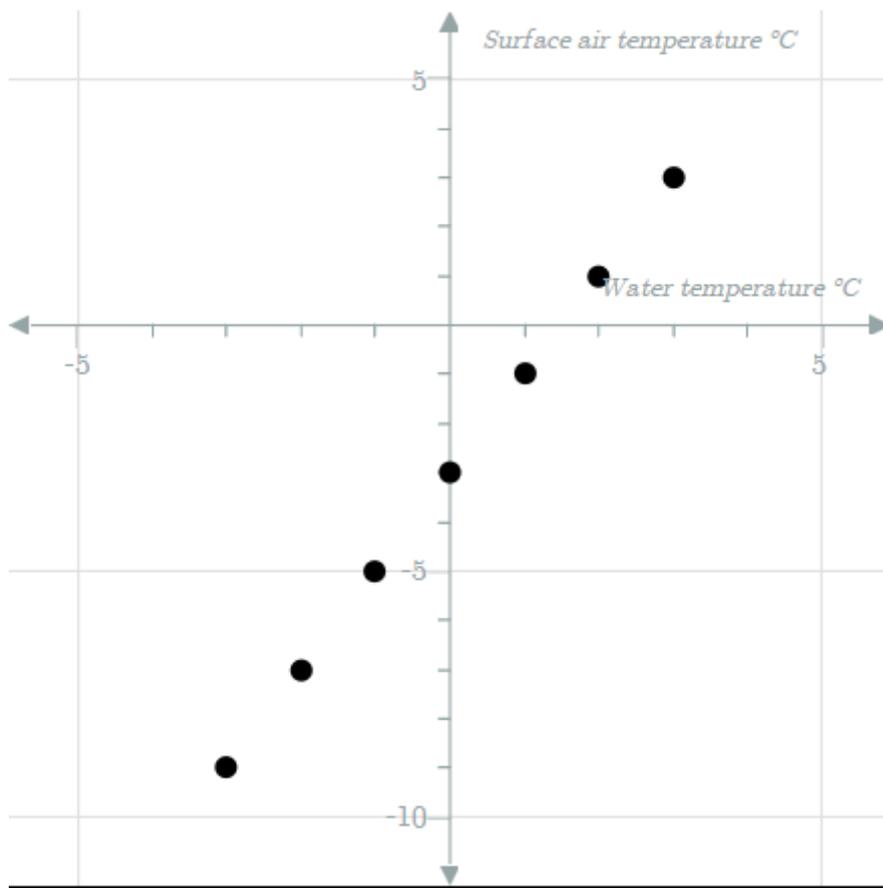


b) Write an equation that represents the height of the plant,  $h$  cm.

c) How tall is the plant when Sam started to collect data?

d) On which day will the plant be 10 cm tall?

Q2. The graph shows the relationship between water temperatures and surface air temperatures.



a) Complete the table of values

Water temperature (°C)	-3	-2	-1	0	1	2	3
Surface air temperature (°C)							

b) Which of the following equations accurately represents the surface air temperature, °C.

i)  $y = x - 3$

ii)  $y = x - 2$

iii)  $y = 2x - 3$

iv)  $y = 3x - 3$

c) What is the surface air temperature when the water temperature is 15°C?

d) What is the water temperature when the surface air temperature is 25°C?

Q3. The table shows a diver's descent below the surface at a constant rate over a period of 5 minutes.

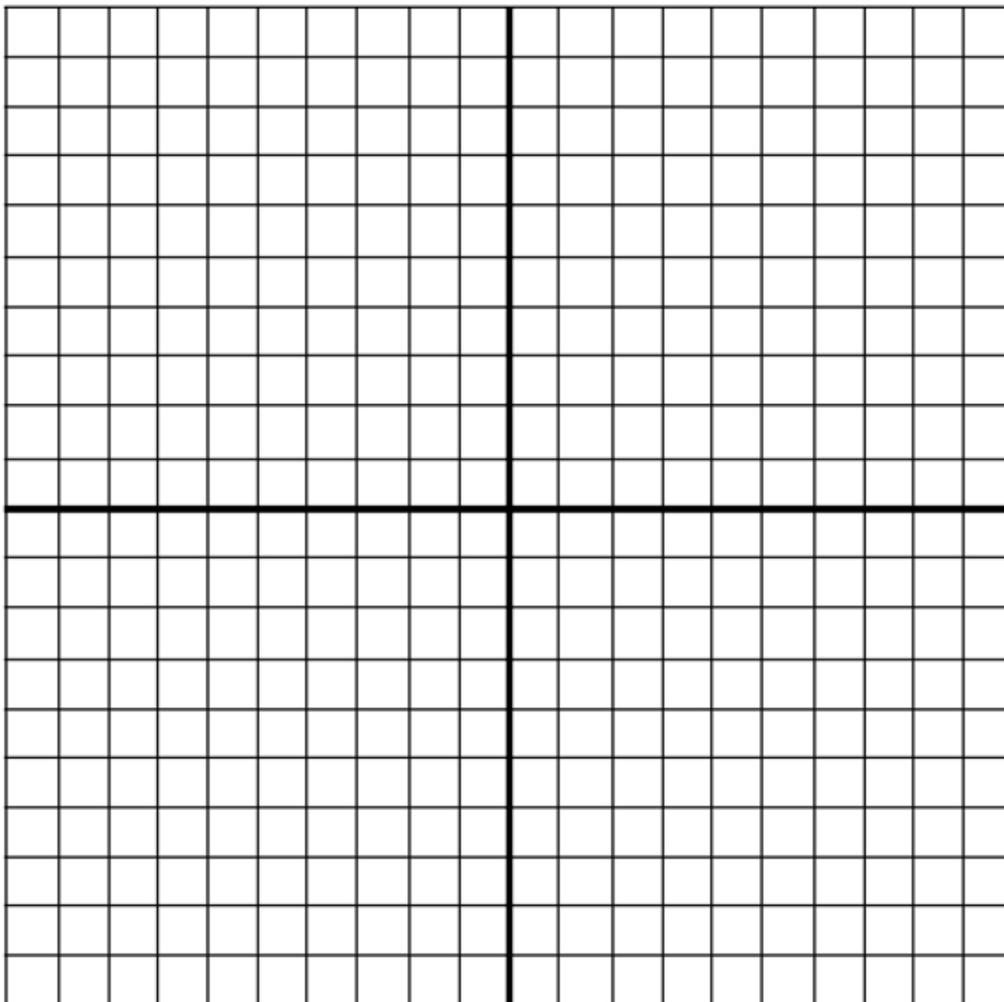
Number of minutes passed ( $x$ )	0	1	2	3	4
Depth of the diver in metres ( $y$ )	0	1.5	3	4.5	6

a) Write an equation representing the depth of the diver in metres.

b) What is the depth of the diver after 8 minutes?

c) How long will it take the diver to reach a depth of 13.5?

d) Draw this linear function on a graph.



## 2019 EM3 Week 15 Investigation

### Question 1

Petrol costs a certain amount per litre. The table shows the cost of various amounts of petrol.

Number of litres ( $x$ )	0	10	20	30	40
Cost of petrol ( $y$ )	0	16.40	32.80	49.20	65.60

- Write an equation linking the number of litres of petrol pumped ( $x$ ) and the cost of the petrol ( $y$ )
- How much does petrol cost per litre?
- How much would 47 litres of petrol cost at this unit price?
- In the equation,  $y = 1.64x$ , what does 1.64 represent?

### Question 2

There are 20 litres of water in a rainwater tank. It rains for a period of 24 hours and during this time, the tank fills up at a rate of 8 litres per hour.

- Complete the table of values:

Number of hours passed ( $x$ )	0	1	2	3	4	4.5	10
Amount of water in tank ( $y$ )							

- Write an algebraic relationship linking the number of hours passed ( $x$ ) and the amount of water in the tank ( $y$ ).

c) Plot the points on the number plane.

