Mock Grade 6

Maths Booklet 3

Paper 3H
Calculator

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1 (a) Solve $\dfrac{6 + 2x}{8} = 11 - x$
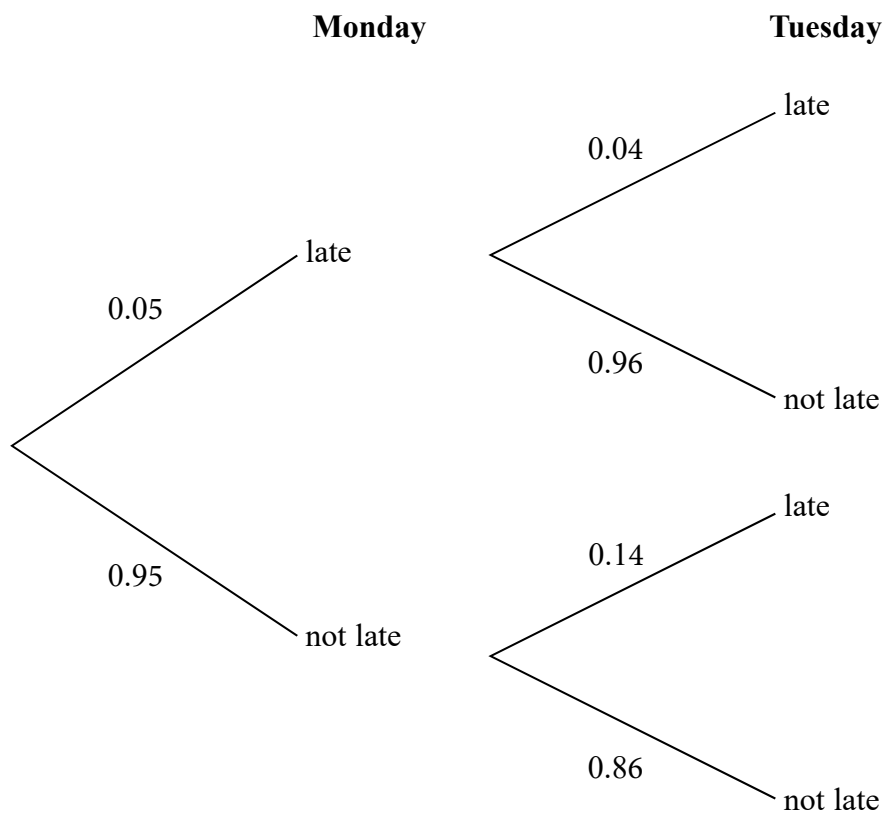
$x =$ ....

(3)

(b) Simplify $\dfrac{x^2 + 7x - 18}{2x^2 - x - 6}$

....

(1)

(Total for Question 1 is 4 marks)

2 The probability tree diagram shows the probabilities that Bismah will be late for work on two days next week.

| Monday | | Tuesday |

Calculate the probability that Bismah will be not late on exactly one of the two days.

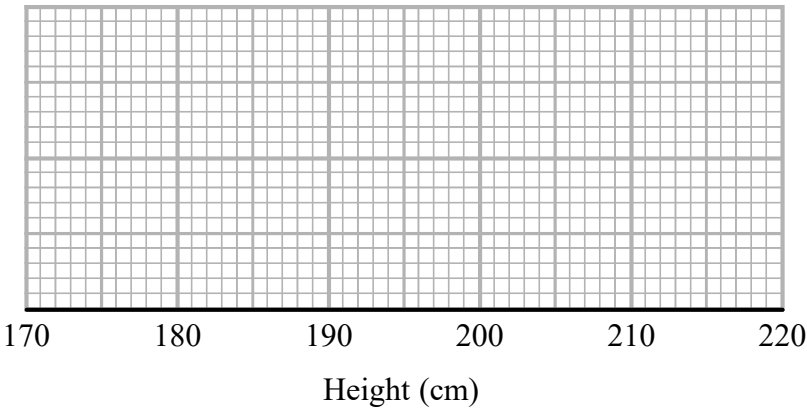...

(Total for Question 2 is 3 marks)

3 The stem and leaf diagram shows information about the heights, in cm, of 23 sunflowers.

17	5	7	9				
18	3	5	5				
19	1	1	2	5	7	7	8
20	3	6	7	8	9	9	
21	4	7	7	8			

Key: 17|5 represents 175 cm

On the grid, draw a box plot for this information.

Height (cm)

(Total for Question 3 is 3 marks)

4 Liquid A and liquid B are mixed together in the ratio 5 : 13 by volume to make liquid C.

Liquid A has density 1.35 g/cm³
Liquid B has density 1.09 g/cm³

A cylindrical container is filled completely with liquid C.
The cylinder has radius 4 cm and height 18 cm.

Work out the mass of the liquid in the container.
Give your answer correct to 3 significant figures.
You must show all your working.

.... g

(Total for Question 4 is 4 marks)

5 The surface gravity of a planet can be worked out using the formula

$$g = \frac{6.67 \times 10^{-11}\, m}{r^2}$$

where

  m kilograms is the mass of the planet
  r metres is the radius of the planet

For the Earth and Jupiter here are the values of m and r.

Earth
$m = 3.68 \times 10^{24}$ $r = 5.812 \times 10^{6}$

Jupiter
$m = 2.53 \times 10^{27}$ $r = 9.236 \times 10^{7}$

Work out the ratio of the surface gravity of Earth to the surface gravity of Jupiter.
Write your answer in the form $1:n$

....

(Total for Question 5 is 3 marks)

6 Solve the simultaneous equations

$$3x - 5y = 18$$
$$2x + 4y = 1$$

$x =$ ....

$y =$ ....

(Total for Question 6 is 4 marks)

7 Zahra mixes 180 g of metal A and 220 g of metal B to make 400 g of an alloy.

Metal A has a density of 18.7 g/cm³.
Metal B has a density of 5.3 g/cm³.

Work out the density of the alloy.

.... g/cm³

(Total for Question 7 is 4 marks)

8
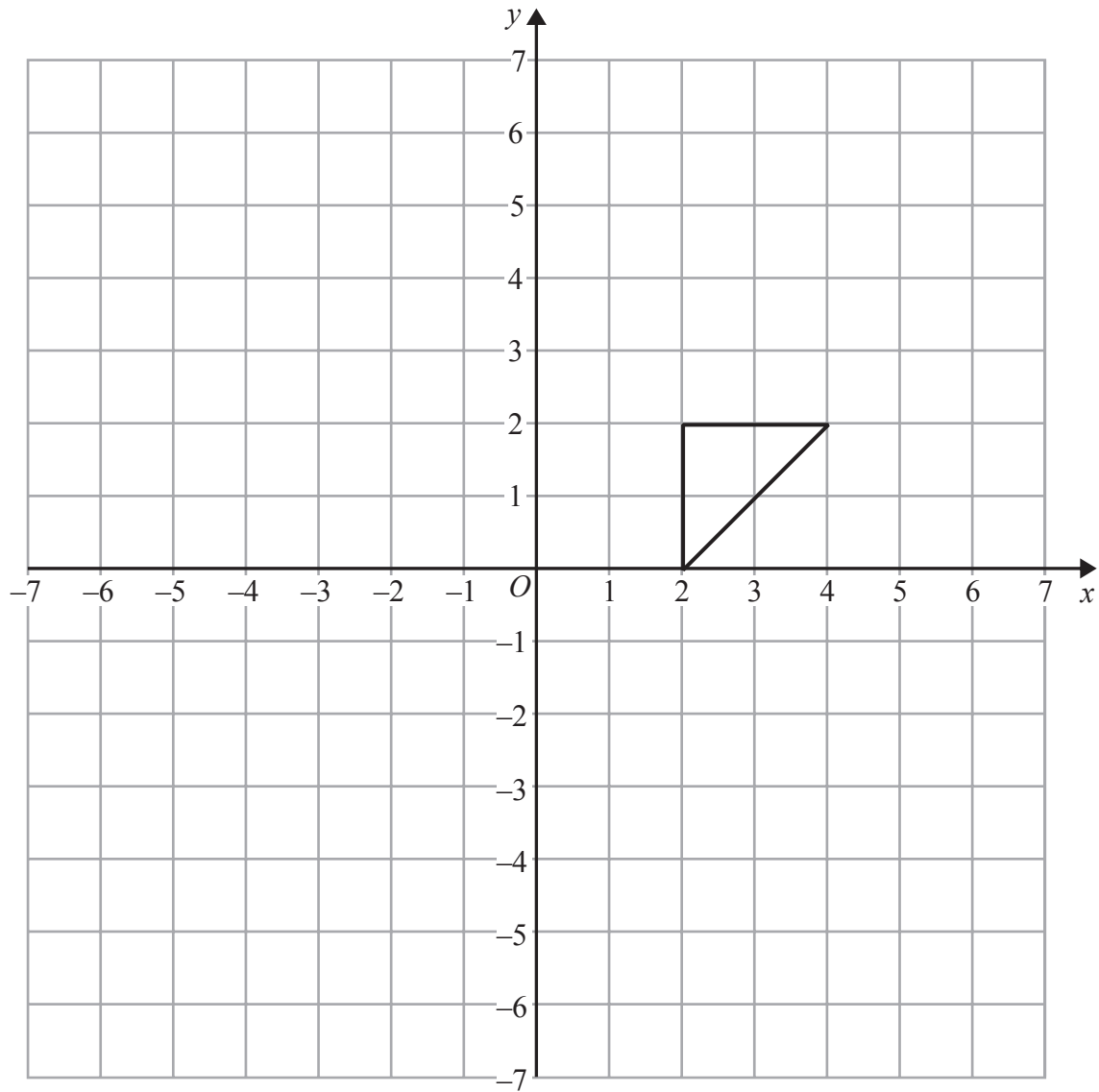
On the grid, enlarge the triangle by scale factor $-1\dfrac{1}{2}$, centre (0, 2)

(Total for Question 8 is 2 marks)

9 On Monday, 18 people took 7 hours to clean a number of cars.
On Tuesday, 14 people cleaned the same number of cars.

Assuming that all the people worked at the same rate,

(a) work out how many hours the 14 people took to clean the cars.

.... hours

(2)

The assumption is wrong.

(b) How might this affect the time taken for the 14 people to clean the cars?

....

....

....

(1)

(Total for Question 9 is 3 marks)