1 Alex makes 80 cakes to sell.

He makes chocolate cakes, lemon cakes and fruit cakes where

$$\text{number of chocolate cakes} : \text{number of lemon cakes} : \text{number of fruit cakes} = 3 : 2 : 5$$

Alex sells

all of the chocolate cakes

$\frac{3}{4}$ of the lemon cakes

$\frac{7}{8}$ of the fruit cakes

The profit he makes on each cake he sells is shown in the table.

Type of cake	Profit per cake he sells
chocolate	£2.00
lemon	£1.70
fruit	£2.40

Work out the total profit that Alex makes from the cakes he sells.

Finding total ratio of cakes :

$3 + 2 + 5 = 10$

Finding number of each cakes :

chocolate : $\frac{3}{10} \times 80 = 24$ cakes

lemon : $\frac{2}{10} \times 80 = 16$ cakes (1)

fruit : $\frac{5}{10} \times 80 = 40$ cakes (1)

Finding number of each cakes sold :

chocolate = 24 cakes

lemon = $\frac{3}{4} \times 16 = 12$ cakes (1)

fruit = $\frac{7}{8} \times 40 = 35$ cakes

Total profit made on cakes sales :

$(24 \times 2) + (12 \times 1.70) + (35 \times 2.40)$

$= 48 + 20.4 + 84$ (1)

$= £152.40$ (1)

£ 152.40

(Total for Question 1 is 5 marks)

2 Andreas, Isla and Paulo share some money in the ratios 3 : 2 : 5

The **total** amount of money that Isla and Paulo receive is £76 more than the amount of money that Andreas receives.

Andreas buys a video game for £48.50 with some of his share of the money.

Work out how much money Andreas has left from his share of the money when he has bought the video game.

Let : Andreas = $3x$

Isla = $2x$

Paulo = $5x$

$\therefore 5x + 2x - 3x = £76$

$x = £19$ (1)

Andreas has $3x \rightarrow 3 \times £19$

$= £57$ (1)

∴ Money Andreas has after buying video game :

$£57 - £48.50$ (1)

$= £8.50$ (1)

£ 8.50

(Total for Question 2 is 4 marks)

3 Brendon, Asha and Julie share some money in the ratios 3 : 2 : 6
The **total** amount of money that Asha and Julie receive is $36

Work out the amount of money that Brendon receives.

Asha and Julie : 2 + 6 = 8

36 ÷ 8 = 4.5 (1) (1 part = 4.5)

Brendon : 3 × 4.5 = $ 13.50
(1)

$ 13.50 (1)

(Total for Question 3 is 3 marks)

4 120 children go on an activity holiday.
The ratio of the number of girls to the number of boys is 3 : 5

On Sunday, all the children either go sailing or go climbing.

$\frac{16}{25}$ of the boys go climbing.

Twice as many girls go sailing as go climbing.

Work out how many children go sailing on Sunday.

Total ratio : 3 + 5 = 8

$\frac{120}{8} = 15$ (1)

Boys : $5 \times 15 = 75$

Girls : $3 \times 15 = 45$ (1)

Climbing

Boys : $\frac{16}{25} \times 75 = 48$ (1)

Girls : $\frac{1}{3} \times 45 = 15$ (1)

Sailing

Boys : $75 - 48 = 27$

Girls : $45 - 15 = 30$

Total sailing : $27 + 30$ (1)

$= 57$ (1)

57

(Total for Question 4 is 6 marks)

5 On a farm there are chickens, ducks and pigs.

The ratio of the number of chickens to the number of ducks is 7 : 2
The ratio of the number of ducks to the number of pigs is 5 : 9
There are 36 pigs on the farm.

Work out the number of chickens on the farm.

Finding number of ducks :

$\frac{36}{9} \times 5 = 20$ ducks (1)

Finding number of chickens :

$\frac{20}{2} \times 7 = 70$ chickens

(1) (1)

70

(Total for Question 5 is 3 marks)

6 Pieter owns a currency conversion shop.

Last Monday, Pieter changed a total of 20 160 rand into a number of different currencies.

He changed $\frac{3}{10}$ of the 20 160 rand into euros.

He changed the rest of the rands into dollars, rupees and francs in the ratios 9 : 5 : 2

Pieter changed more rands into dollars than he changed into francs.

Work out how many more.

9 + 5 + 2 = 16

$\frac{7}{10}$ x 20160 = 14 112 rands (1)

14 112 ÷ 16 = 882 (1)

9 - 2 = 7 (Difference between dollars and francs)

7 x 882 = 6174 rands (1)

(1)

6174 rand

(Total for Question 6 is 4 marks)

7 Behnaz makes 300 celebration cards so that

$$\text{number of birthday cards} : \text{number of anniversary cards} : \text{number of congratulations cards} = 7:5:3$$

(1) $\frac{2}{5}$ of the birthday cards have numbers on them.

(2) 36% of the anniversary cards have numbers on them.
None of the congratulations cards have numbers on them.

Work out what fraction of the 300 cards have numbers on them.
Give your answer in its simplest form.

$7+5+3 = 15$

$\frac{300}{15} = 20$ (1)

(1) $\frac{2}{5} \times 7 \times 20 = 56$ (1)

(2) $0.36 \times 5 \times 20 = 36$ (1)

$\frac{56+36}{300}$ (1) $= \frac{92}{300}$

$= \frac{23}{75}$ (1)

$\frac{23}{75}$

(Total for Question 7 is 5 marks)

8 Danil, Gabriel and Hadley share some money in the ratios 3 : 5 : 9
The difference between the amount of money that Gabriel receives and the amount of money that Hadley receives is 196 euros.

Work out the amount of money that Danil receives.

$\frac{196}{(9-5)} = 49$ (1)

$49 \times 3 = 147$ (1) (1)

147 ..... euros

(Total for Question 8 is 3 marks)

9 A bag contains only pink sweets, white sweets, green sweets and red sweets.

The table gives each of the probabilities that, when a sweet is taken at random from the bag, the sweet will be green or the sweet will be red.

Sweet	pink	white	green	red
Probability	0.3	0.15	0.2	0.35

The ratio
number of pink sweets : number of white sweets = 2 : 1

There are 28 red sweets in the bag.

Work out the number of white sweets in the bag.

$1 - 0.2 - 0.35 = 0.45$ (1)

pink : $\frac{2}{3} \times 0.45 = 0.3$

white : $\frac{1}{3} \times 0.45 = 0.15$ (1)

$\frac{28}{0.35} = 80$ (1)

$0.15 \times 80 = 12$ (1)

(1)

12

.....

(Total for Question 9 is 5 marks)

10 *C* grams of chocolate is shared in the ratios 2 : 5 : 8
The difference between the largest share and the smallest share is 390 grams.

Work out the value of *C*

$\frac{390}{8-2} = 65$ (1)

$65 \times (2+5+8)$ (1)

$65 \times 15 = 975$ (1)

C = 975

(Total for Question 10 is 3 marks)

11 In a box, there are only green sweets, orange sweets and yellow sweets.

There are 280 sweets in the box so that

the number of green sweets : the number of orange sweets = 2 : 3

and

the number of orange sweets : the number of yellow sweets = 1 : 5

Work out how many green sweets there are in the box.

G : O : Y

2 3

1×3 5×3

2 : 3 : 15 (1)

$\frac{2}{2+3+15} \times 280$

$= \frac{2}{20} \times \overset{14}{\cancel{280}}$ (1)

= 28 (1)

28

(Total for Question 11 is 3 marks)

12 Last season, the number of goals scored by Arjun, by Simon and by Kath for their football team were in the ratios 2 : 5 : 8

Simon scored 12 more goals than Arjun.

Work out the number of goals scored by Kath.

difference in ratio : 5 − 2 = 3

1 ratio equals to = $\frac{12}{3}$ = 4 goals (1)

Kath scores : 8 × 4 = 32 goals (1) (1)

32

(Total for Question 12 is 3 marks)

13

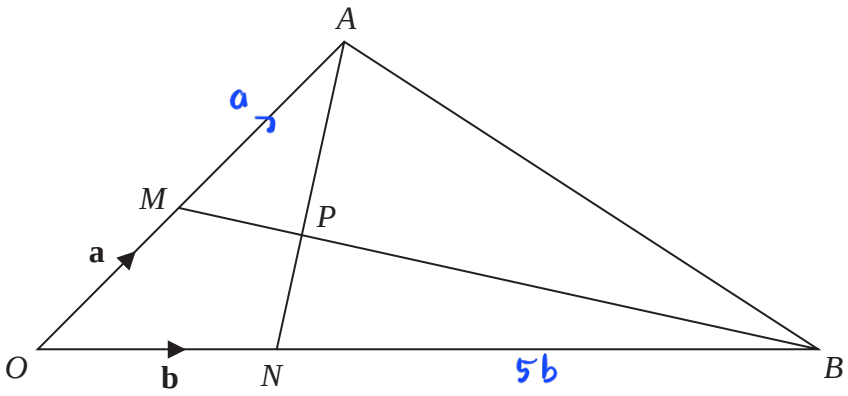

Diagram **NOT** accurately drawn

OMA, *ONB*, *MPB* and *NPA* are straight lines.

M is the midpoint of *OA*

ON : *NB* = 1 : 5

$\overrightarrow{OM} = \mathbf{a}$ $\overrightarrow{ON} = \mathbf{b}$

(b) Use a vector method to find the ratio *AP* : *PN*

$\overrightarrow{OP} = \overrightarrow{OM} + \overrightarrow{MP}$

$= \underline{a} + \lambda(\overrightarrow{MB})$ (1)

$= \underline{a} + \lambda(-\underline{a} + 6\underline{b})$

$\overrightarrow{OP} = \overrightarrow{OA} + \overrightarrow{AP}$

$= 2\underline{a} + \mu(\overrightarrow{AN})$ (1)

$= 2\underline{a} + \mu(-2\underline{a} + \underline{b})$

$\underline{a}: 1 - \lambda = 2 - 2\mu$ — (1)

$\underline{b}: 6\lambda = \mu$ — (2) (1)

substitute (2) into (1):

$1 - \lambda = 2 - 2(6\lambda)$

$1 - \lambda = 2 - 12\lambda$

$11\lambda = 1$

$\lambda = \frac{1}{11}$ $\mu = \frac{6}{11}$

$\overrightarrow{AP} = \frac{6}{11}\overrightarrow{AN}$

$\overrightarrow{AP} : \overrightarrow{PN} = 6 : 5$ (1)

$AP : PN =$ 6 : 5

(4)

(Total for Question 13 is 4 marks)

14 Nancy has some coins with a total value of 85 pence.
She has only 2 pence coins and 5 pence coins.
The ratio

number of 2 pence coins : number of 5 pence coins = 1 : 3

Nancy has more 5 pence coins than 2 pence coins.

How many more?

let no. of 2 pence coins = x

5 pence coins = $3x$

$2x + 5(3x) = 85$ (1)

$17x = 85$

$x = \frac{85}{17} = 5$ (1)

2 pence = 5 coins

5 pence = 15 coins (1)

$15 - 5 = 10$

10 (1)

(Total for Question 14 is 4 marks)