Q1.   Grace and Jack share £140 in the ratio 3 : 4

Work out the amount of money that Jack gets.

£ ....

(Total 2 marks)

Q2.   Ali, Ben and Candice share £300 in the ratio 2 : 3 : 5.

How much money does Candice get?

£ ....

(Total 2 marks)

Q3.   Anwar, Bethany and Colin each earn the same weekly wage.

Each week, Anwar saves 12% of his wage and spends the rest.

Each week, Bethany spends $\frac{7}{8}$ of her wage and saves the rest.

The ratio of the money Colin saves each week to what he spends is 1 : 9

Which of Anwar, Bethany and Colin, saves the most money each week?
You must show each stage of your working.

....

(Total 4 marks)

Q4.   Jenny uses her mother's recipe to make cheese scones.
Her recipe uses a mixture of self-raising flour, butter and cheese in the ratio 6 : 2 : 1 by weight.

In her kitchen, Jenny has:
2 kg of self-raising flour,
500 grams of butter,
200 grams of cheese.

When Jenny makes cheese scones each scone needs about 45 grams of mixture.

Work out the largest number of cheese scones that Jenny can make.

(Total 4 marks)

Q5.   A garage sells British cars and foreign cars.
        The ratio of the number of British cars sold to the number of foreign cars sold is 2 : 7

        The garage sells 45 cars in one week.

        (a)   Work out the number of British cars the garage sold that week.

                                        ....

(2)

        A car tyre costs £80 plus VAT at $17\frac{1}{2}$%.

        (b)   Work out the total cost of the tyre.

£ ....

(3)

The value of a new car is £12 000
The value of the car depreciates by 20% per year.

(c)   Work out the value of the car after 2 years.

£ ....

(3)
(Total 8 marks)

Q6.   A garage sells British cars and foreign cars.
          The ratio of the number of British cars sold to the number of foreign cars sold is 2 : 7

          The garage sells 45 cars in one week.

          (a)   Work out the number of British cars the garage sold that week.

....

(2)

A car tyre costs £80 plus VAT at $17\frac{1}{2}$ %.

(b)   Work out the total cost of the tyre.

£ ....
(3)
(Total 5 marks)

Q7.   A coin is made from copper and nickel.
84% of its weight is copper.
16% of its weight is nickel.

Find the ratio of the weight of copper to the weight of nickel.
Give your ratio in its simplest form.

....
(Total 2 marks)

Q8.   A tin of cat food costs 40p.
A shop has a special offer on the cat food.

Special offer

Pay for 2 tins and get 1 tin free

Julie wants 12 tins of cat food.

(a)   Work out how much she pays.

£ ....

(3)

The normal price of a cat basket is £20
In a sale, the price of the cat basket is reduced by 15%.

(b)   Work out the sale price of the cat basket.

£ ....

(3)
(Total 6 marks)

Q9.   Here are the ingredients for making cheese pie for 6 people.

Cheese pie for 6 people

180 g flour

240 g cheese

80 g butter

4 eggs

160 ml milk

Bill makes a cheese pie for 3 people.

(a)   Work out how much flour he needs.

.... g

(2)

Jenny makes a cheese pie for 15 people.

(b)   Work out how much milk she needs.

.... m*l*

(2)
(Total 4 marks)

Q10.   Sidra and Gemma share £48 in the ratio 5 : 3

Work out how much more money Sidra gets than Gemma gets.

£ ....

(Total 3 marks)

Q11.   A tin of cat food costs 40p.
        A shop has a special offer on the cat food.

Julie wants 12 tins of cat food.

(a)   Work out how much she pays.

£ ....

(3)

9 of the 12 tins are tuna.

(b)   Write 9 out of 12 as a percentage.

.... %

(2)

The normal price of a cat basket is £20
In a sale, the price of the cat basket is reduced by 15%.

(c)   Work out the sale price of the cat basket.

£ ....

(3)
(Total 8 marks)

Q12.   There are some sweets in a bag.

18 of the sweets are toffees.
12 of the sweets are mints.

(a)   Write down the ratio of the number of toffees to the number of mints.
        Give your ratio in its simplest form.

.... **:** ....

(2)

There are some oranges and apples in a box.
The total number of oranges and apples is 54.
The ratio of the number of oranges to the number of apples is 1 : 5.

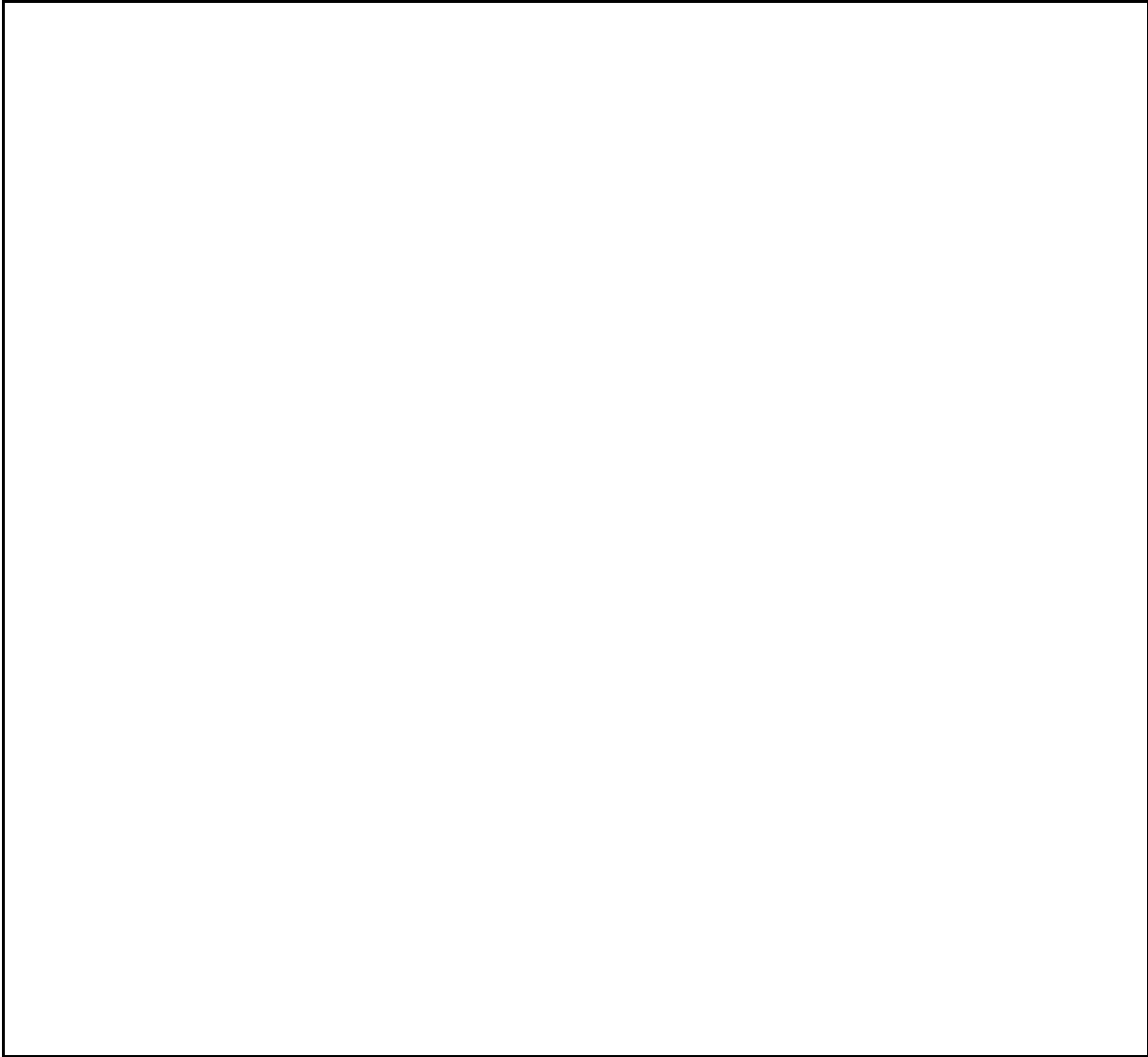(b)   Work out the number of apples in the box.

....

(2)
(Total 4 marks)

Q13.   Peter won £75 as a prize.

He gave $\frac{4}{5}$ of the prize money as a present to Roger and Bethan.

Roger and Bethan shared the present in the ratio 2 : 3

Work out how much they each got.

Roger ....

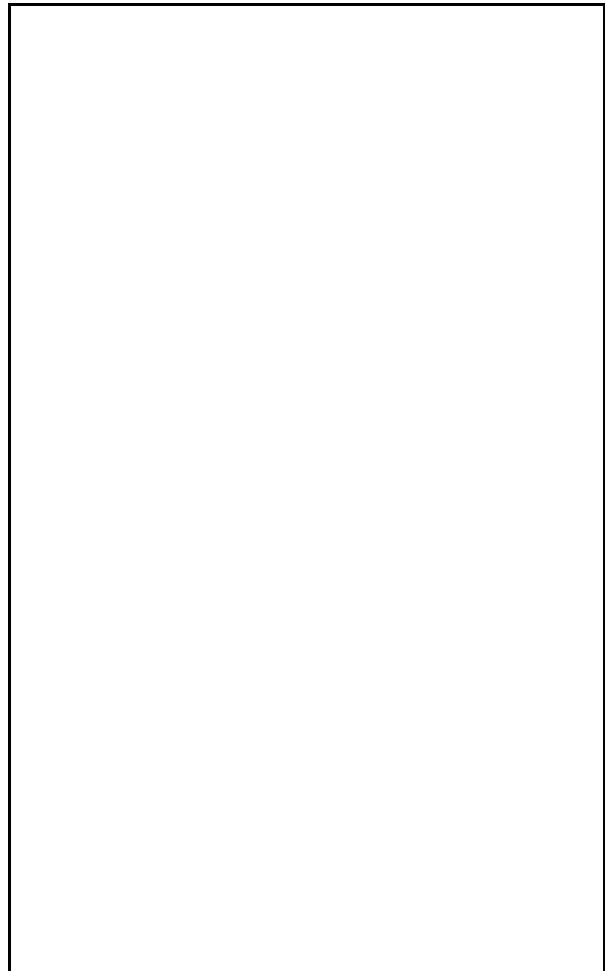Bethan ....

(Total 4 marks)

Q14.   Jennie's council has a target of $\frac{1}{5}$ for households to recycle their waste.

In January, Jennie recycled $\frac{1}{10}$ of her household waste.

In February, she recycled 15 kg of her 120 kg of household waste.

Her result for March was 13% recycled out of 112 kg of household waste.

Has Jennie met the council's target?
Which was her best month for recycling?
Show clearly how you got your answers.

(Total 4 marks)

M1.

Working	Answer	Mark	Additional Guidance
$140 \div (3 + 4)(= 20)$ "20" × 4	80	2	**M1** for $140 \div (3 + 4)$ or 20 or $\frac{4}{7} \times 140$ **A1** cao
			Total for Question: 2 marks

M2.

Working	Answer	Mark	Additional Guidance
$300 \div (2 + 3 + 5) \times 5 =$ $300 \div 10 \times 5 =$	150	2	**M1** for $300 \div (2 + 3 + 5)$ or 300×5 or 30 seen or 60:90:150 **A1** cao
			Total for Question: 2 marks

M3.

Working	Answer	Mark	Additional Guidance

Bethany | 4

| | | | | **Total for Question: 4 marks** |

M4.

	Working	**Answer**	**Mark**	**Additional Guidance**
FE	Scone 30g:10g:5g 200 ÷ 5 = 40 500 ÷ 10 = 50 2000 ÷ 30 = 66.7	40	4	**M1** for 45÷(6+2+1) **A1** for SRF = 30, B = 10, C = 5 **M1** for 200÷5 or 500÷10 or 2000÷30 **A1** cao **OR** **M1** for 6×200 or 2×200 or 1×200 or 6×500 or 2×500 or 1×500 or 6×2000 or 2×2000 or 1×2000 **A1** for SRF, B, C = 1200, 400, 200 or 1500, 500, 250 or 2000, 666.7, 33.3 **M1** for (1200 + 400 + 200)/45 **A1** cao.
				Total for Question: 4 marks

M5.

	Working	**Answer**	**Mark**	**Additional Guidance**
(a)	45 × 2 ÷ 9	10	2	**M1** for 45 ÷ "2 + 7" or 45 × 2 or 5 seen, or 90 seen or 10 seen as part of a ratio e.g 10:35

				A1 cao
(b)	$(80 \times 17.5/100) + 80 =$ $14 + 80 =$	£94	3	**M2** for $80 \times \dfrac{117.5}{100}$ or 80×1.175 oe **A1** cao or **M1** for 80×0.175 or $80 \times \dfrac{17.5}{100}$ oe or 14 seen or 8 + 4 + 2 seen **M1**(dep) '14' + 80 or $80 + 80 \times \dfrac{17.5}{100}$ oe **A1** cao
(c)	12000×0.8^2 **OR** 1st yr: $12000 \times 0.2 = 2400$; $12000 - 2400 = 9600$ 2nd yr: $9600 \times 0.2 = 1920$; $9600 - 1920 = 7680$ [3rd year is £6144; 4th yr is £4915.20]	£7680	3	**M2** for 12000×0.8^2 or 12000×0.8^3 **A1** cao **OR** **M1** 12000×0.8 oe or 9600 or 2400 or 4800 or 7200 seen **M1**(dep) '9600' × 0.8 oe **A1** cao (if correct answer seen, ignore extra years)
				Total for Question: 8 marks

M6.

	Working	**Answer**	**Mark**	**Additional Guidance**
(a)	$45 \times 2 \div 9$	10	2	**M1** for 45×2 or $45 \div$ "2 + 7" or 5 seen, or 90 seen, or 10 seen as part of a ratio (eg 10:35) **A1** cao
(b)	$(80 \times 17.5/100) + 80$ $= 14 + 80 =$	£94	3	**M2** for $80 \times \dfrac{117.5}{100}$ or 80×1.175 oe **A1** cao or **M1** for 80×0.175 or $80 \times \dfrac{17.5}{100}$ oe or 14 seen or 8 + 4 + 2 seen **M1**(dep) '14' + 80 or $80 + (80 \times 0.175)$ oe **A1** cao

Total for Question: 5 marks

M7.

Working	Answer	Mark	Additional Guidance
84:16 or 42:8	21:4	2	**M1** 84:16 or 42:8 or 4:21 or 5.25:1 or 1:0.19…, or any multiple of 84:16 (eg 8.4:1.6, 21:4, 10.5:2), or for answers given the wrong way around. For **M1** ignore % signs. **A1** cao
			Total for Question: 2 marks

M8.

	Working	Answer	Mark	Additional Guidance
(a)	$12 \div 3 \times 2 (= 8)$ 8×40 Alternative 3 tins = 40 × 2 = 80 12 tins = 80 × 4	3.20	3	**M2** for 40 × 12 ÷ 3 × 2 or better (inc. adding 8 lots of 40p) (**M1** for using 2 of the 3 operations or 8 seen) **A1** cao **OR** **M1** for 3 tins = 40 × 2 **M1** (dep) for "80" × 4 **A1** cao [SC: **B2** for sight of digits 320 if M0 scored] [SC: **B1** for 480 or 4.80 if M0 scored]
(b)	$\dfrac{15}{100} \times 20 = 3$	17	3	**M1** for $\dfrac{15}{100}$ × 20 oe or a correct method to work out 10% and 5% of 20 or 2 and 1 seen **A1** for 3 cao

OR 10% = 20 ÷10 = 2 5% = 2 ÷2 = 1 15% = 2 + 1 = 3 20 − 3 <u>Alternative</u> 20 × 0.85		**A1** ft for 20 − "3" dependant upon **M1** scored [SC: **B2** for 3 on answer line with no working] <u>**Alternative**</u> **B1** cao for 85 or 0.85 seen **M1** for $\dfrac{"100 - 15"}{100}$ or "1 − 0.15" × 20 **A1** ft for a correct solution of $\dfrac{"100 - 15"}{100}$ or "1 − 0.15" × 20 **OR** 17 (dep on **M1** scored)

Total for Question: 6 marks

M9.

	Working	Answer	Mark	Additional Guidance
(a)	180 ÷ 2	90	2	**M1** for 180 ÷ 2 **OR** 180 ÷ 6 × 3 **A1** cao
(b)	160 × 2.5	400	2	**M1** for 160 × 2.5 **OR** 160 ÷ 6 × 15 **OR** 160 ÷ 2 × 5 oe **A1** cao SC: **B1** for an answer of 399 to 405

Total for Question: 4 marks

M10.

Working	Answer	Mark	Additional Guidance
48 ÷ 8 = 6 6 × 5 − 6 × 3 = 12	12	3	**M1** for 48 ÷ "5 + 3" **M1** (dep) for "6" × 5 or 30 seen or "6" × 3 or 18 seen or "6" × 2

			A1 cao	

| | | | **Total for Question: 3 marks** |

M11.

	Working	**Answer**	**Mark**	**Additional Guidance**
(a)	$12 \div 3 \times 2 \ (= 8)$ 8×40 Alternative: 3 tins = $40 \times 2 = 80$ 12 tins = 80×4	3.20	3	**M2** for $40 \times 12 \div 3 \times 2$ or better (inc. adding 8 lots of 40p) (**M1** for using 2 of the 3 operations or 8 seen) **A1** cao **OR** **M1** for 3 tins = 40×2 (=80) **M1** for "80" × 4 **A1** cao [SC: if M0 scored: **B2** for digits 32, or **B1** for 480 or 4.80]
(b)	$\dfrac{9}{12} \times 100$	75	2	**M1** for $\dfrac{9}{12}$ oe **A1** cao

(c)	$\dfrac{15}{100} \times 20 = 3$
	
	OR 10% = $20 \div 10 = 2$
	    5% = $2 \div 2 = 1$
	    15% = $2 + 1 = 3$
	$20 - 3$
	Alternative:
	20×0.85
		17	3	**M1** for $\dfrac{15}{100} \times 20$ oe or a correct method to work out 10% and 5% of 20, or 2 and 1 seen
				A1 for 3 cao
				A1 ft for 20 – "3" dependent on **M1** scored
				Alternative:
				B1 cao for 85 or 0.85 seen
				M1 for $\dfrac{"100 - 15"}{100} \times 20$ or "1 – 0.15" × 20
				A1 ft for a correct solution of $\dfrac{"100 - 15"}{100} \times 20$ or "1 – 0.15" × 20 or 17 dependent on **M1** scored
				SC (for both alternatives) **B2** for £3

| | | | **Total for Question: 8 marks** |

M12.

	Working	Answer	Mark	Additional Guidance
(a)	18 ÷ 6:12 ÷ 6	3 : 2	2	**M1** for 18 : 12 or 12 : 18 or 1.5:1 or 1:0.67 oe or correct ratio reversed eg 2:3 **A1** for 3 : 2 or 1 : 0.6 … [recurring]
(b)	5 + 1 = 6 54 ÷ 6 = 9 5 × 9	45	2	**M1** for $\frac{5}{5+1}$ × 54 or $\frac{1}{5+1}$ × 54 or 54 ÷ '5 + 1' or 54 × 5 or 270 or 9 : 45 or 9 seen, as long as it is not associated with incorrect working. **A1** for 45 cao
				Total for Question: 4 marks

M13.

Working	Answer	Mark	Additional Guidance

$\frac{4}{5} \times 75 = 60$ $60 \div 5 = 12$	Roger 24	4
$3 \times 12 = 36$	Bethan 36	
$2 \times 12 = 24$		

$\frac{4}{5} \times 75 = 60$ $60 \div 5 = 12$

$3 \times 12 = 36$

$2 \times 12 = 24$

				Total for Question: 4 marks

M14.

	Working	**Answer**	**Mark**	**Additional Guidance**
QWC iii FE	See table at end	Best month and supporting explanation	4	**M1** Converts for at least 2 months to a common format (fractions, decimals or %age) **A1** all correct **C1** for Council target: No (yes) dep on M1 and consistent with the candidates calculations **QWC: Decisions should be started, following through from working out** **C1** March with all calculations correct for the 3 months **QWC: Decisions should be started, following through from working out**
				Total for Question: 4 marks

	Fraction	**Decimal**	**%**	**kg**
Jan	$\frac{1}{10}$	0.1	10%	Not known
Feb	$\frac{1}{8}$	0.125	12.5%	15 kg
Mar	$\frac{13}{100}$	0.13	13%	14.56 kg

##

Successful candidates either worked out the value of 1 share or used equivalent ratios 3:4, 30:40 and 60:80. Errors occurred when candidates did not initially divide £140 by 7 but divided by either 3 or 4 leading to common incorrect answers of £105 or £35. Some candidates just divided £140 into 2 equal parts. As this was the first question on the paper, it may have been haste to get on that led to some candidates who completed correct calculations not presenting Jack's share alone as the final answer. On this occasion they did gain full credit but centres could encourage candidates to reread a question before moving on to make sure that they have answered the actual demand.

##

Foundation

A common mistake was to just divide the individual numbers in the ratio. Some noticed that 5 was half of 10 and so found half of 300 to get to the answer.

Higher

This proved to be a straight forward question with 83% of candidates scoring both marks. Just under 11% failed to score. A few realised that Candice's share was a half and simply divided the amount by 2. The most common error was 300 ÷ 2, 300 ÷ 3 and 300 ÷ 5 leading to 150, 100 and 60. Had candidates checked these they might have realised that these values do not sum to 300. Occasionally, some incorrectly added 2 + 3 + 5, but were still able to get the method mark if evidence was seen.

E5.   Part (a) was very well done. A few candidates wrote down both 10 and 35 without identifying which value answered the question. They got one of the two marks.
Part (b) was also very well done with a majority of answers involving multiplying by 117.5/100 to get the answer directly. Of course, there were a considerable number who worked out 80 × 17.5/100 and added the answer to 80.

A few took the 8 + 4 + 2 route to get to the £94.

The main errors were a failure to add the £14 to £80 and a miscalculation on the

£8 + £4 + £2, usually at the $2\frac{1}{2}$ % stage.

Part (c) was a standard depreciation question. It was pleasing to see so many students using the efficient 12000×0.8^2 although many who used a careful step by step approach also gained full marks. A common misread was 1200 for 12000, which resulted in the loss of 1 mark. A few candidates added on the 20%.

Of course, there were many candidates who worked out 20% of £12000 and then subtracted 2 × 2400 to get the wrong answer £7200

E6.   It was usual to award some method marks in some part of this question, but few answers both parts correctly. Lots of candidates wrote their answer as 10:35, misreading the question. Trial and improvement methods were also seen. It is a real concern that so many candidates had little idea with regard to calculating percentages. Many non-calculator methods were seen, which rarely attracted any marks due to the many numerical errors that accompanied them. Some candidates went as far as calculating the VAT, but then failed to add it on to find the total.

E7.   The majority of candidates gave their answer as ratios, but the weaker candidates used fractions. Those candidates who gave their answer as a ratio often left their answer as 84:16 or made errors when cancelling. A significant number of candidates reversed the order of the ratios.

E8.   In part (a), most candidates realised the need to pay for 8 tins of cat food in order to get 12; however a significant number of candidates made arithmetic errors in their calculation of 40 × 8 Some candidates just worked out the cost of 12 tins, while many assumed the offer was "buy one get one free" and just calculated the cost of 6 tins.

Part (b) was generally answered well with most candidates able, with whatever method, to correctly work out 15% of £20. However a common error was to say 10% = £2, then 5% = £4 rather than £1. A significant number of candidates did not then subtract the reduction from £20 and thus failed to score the final mark.

E9.   **Foundation**

Most candidates were able to halve 180 correctly without any working, scoring both available marks in part (a). However, some candidates failed to read the question carefully and thought that you just divided 180 by 3 reaching an answer of 60. A few multiplied 180 by 3 thinking the initial ingredients were sufficient for one person.

Around 60% of the candidates managed to find that 400 ml of milk was needed in (b). Many clearly understood what to do but lost an accuracy mark when they prematurely rounded their answer to 160 ÷ 6, reaching a final answer somewhere between 399 and 405. A surprising number of candidates recognised the need to find the amount of milk needed for 3 people but then proceeded to divided 160 by 3.

Higher

The correct answer to part (a) was obtained by the vast majority of candidates. Those few candidates that did not obtain the correct answer generally divided by 3 rather than 2. Part (b) was less well done. Approximately 5% of candidates gained only 1 out of 2 marks; this was generally due to a loss of accuracy due to premature rounding although the incorrect answers to 160 ÷ 2 or 160 × 2 were also frequently seen.

E10.   **Foundation**

Not all candidates attempted this question. About half of the responses seen deserved 1 mark or more for attempting to work out at least one of the two shares. A good number of candidates stopped at this point, and so were unable to gain all 3 marks. Some candidates showed little understanding of the problem and merely tried to divide 48 by .5 and/or 3.

Higher

The more able candidates had no trouble at all in answering this question correctly; errors tending to reflect poor reading of the question by failing to give the difference of the two girls' share. Weaker candidates often tried to divide 48 by 5 and then by 3, thus making little progress. Some, who had calculated 6 correctly then did 6 × 5 and 3 × 5 (instead of 6).

E11.   This question differentiated well between candidates. Part (a) was quite well done, many candidates using a diagrammatic representation or writing down lists to help them understand the situation. These methods commonly lead to the award of at least 2 of the 3 marks available. Poor arithmetic affected some candidate's responses whilst others just worked out the cost of 12 tins (£4.80) or of 6 tins. This latter group seemed to be under the illusion that the offer was equivalent to "buy one, get one free". Many attempts to part (b) of the question gave 9/12 as the relevant fraction, but commonly candidates were unable to convert this to a percentage. 44% of candidates scored full marks in part (b). Part (c) was quite well done. Some candidates worked out the price reduction but did not subtract it from the normal price to find the sale price. Weaker candidates merely subtracted 15(%) from (£)20 and gave the answer £5.

E12.   **Specification A**

Foundation

In part (a) the vast majority of candidates scored a mark for a ratio of 18:12 or equivalent, despite some failing to correctly cancel the ratio, or gave the ratio the wrong way around. There were many correct answers. In part (b) some candidates successfully calculated the ratio of oranges to apples as 9:45 but chose 9 as their final answer. The weaker candidates divided 54 by 5 and rounded the answer to 11.

Higher

In part (a) those who did not score full marks either did not simplify fully or had the ratio around the wrong way. The colon on the answer line seemed to be a very good prompt for candidates. In part (b) the majority of candidates scored 2 marks for "45"; this was generally accompanied by workings which showed division by 6 and multiplication by 5 in that order. Some candidates built up the ratio from "1:5" to "2:10" to "3:15" etc summing the parts until the correct one of "9:45" was obtained. One mark was commonly obtained for "9", sometimes for the ratio "9:45" and rarely for "270".

Zero marks were awarded a number of times for the incorrect response of "10.8", obtained from "54/5".

Specification B

Foundation

There was a good understanding of the word 'ratio' and two thirds of the candidates were able to gain at least the method mark in the first part of the question. The two most common errors were to state the ratio in the wrong order or to make a mistake in simplifying it.

There were fewer marks awarded in part (b) as the method required seemed to elude them with only 40% scoring any marks at all. For those with determination, working through a list seemed to be the only option as they began with the given ratio of 1:5 and worked up by multiplication to 9:45; although they did not always understand what they had achieved when they arrived at that ratio.

Higher

Both parts of this question were very well answered. A few candidates wrote the ratio as 9:6 for their final answer in (a) or wrote the final answer as 2:3.