

Q1. (a) Change $\frac{5}{8}$ to a decimal.

.....

(2)

(b) Work out $\frac{2}{5} + \frac{1}{7}$

.....

(2)

(c) Work out $2\frac{1}{2} \times 1\frac{3}{5}$

.....

(3)
(Total 7 marks)

Q2. Alan bought 20 melons for £15.

$\frac{1}{5}$ of the melons were bad so he threw them away.

He sold the remaining melons for £1.50 each.

Work out Alan's profit.

£

(Total 4 marks)

Q3. Work out $\frac{3}{5} \times \frac{1}{4}$.

.....

(Total 2 marks)

Q4. Work out $\frac{1}{8} + \frac{3}{4}$.

.....

(Total 2 marks)

Q5. Last year, Jora spent
30% of his salary on rent
 $\frac{2}{5}$ of his salary on entertainment
 $\frac{1}{4}$ of his salary on living expenses.

He saved the rest of his salary.

Jora spent £3600 on living expenses.

Work out how much money he saved.

£

(Total 5 marks)

Q6. Mrs White wants to buy a new washing machine.

Three shops sell the washing machine she wants.

Clean Machines



Washing machine

Buy now pay later!
£50 deposit plus

Electrics



Washing machine

$\frac{1}{4}$ off the usual price
of

Wash 'n' Go



Washing machine

£280
plus

10 equal payments of £27

£420

VAT at $17\frac{1}{2}\%$

Mrs White wants to buy the cheapest one.
She decides to buy her washing machine from one of these 3 shops.

From which of these shops should she buy her washing machine?
You must show how you decided on your answer.

.....

(Total 6 marks)

- Q7.** 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)

Q8. (a) Write down the reciprocal of 4

.....

(1)

(b) Work out the value of $2\frac{4}{5} - 1\frac{3}{4}$

Give your answer as a fraction in its simplest form.

.....

(3)

- (c) Sundas says that $4\frac{1}{3}$ is equal to 4.3

Sundas is **wrong**.
Explain why.

.....

.....

(1)

(Total 5 marks)

- Q9.** (a) Work out $\frac{1}{3} + \frac{1}{12}$

.....

(2)

- (b) Work out $\frac{3}{4} \times \frac{1}{5}$

.....

(1)

(Total 3 marks)

Q10. Work out $\frac{2}{5} + \frac{1}{7}$

.....

(Total 2 marks)

Q11. There are 600 counters in a bag.

90 of the counters are yellow.

- (a) Work out 90 as a fraction of 600.
Give your answer in its simplest form.

.....

(2)

180 of the 600 counters in the bag are red.

- (b) Work out 180 as a percentage of 600.

..... %

(2)

The rest of the counters in the bag are blue or green.
There are twice as many blue counters as green counters.

(c) Work out the number of green counters in the bag.

.....

(2)
(Total 6 marks)

Q12. 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)

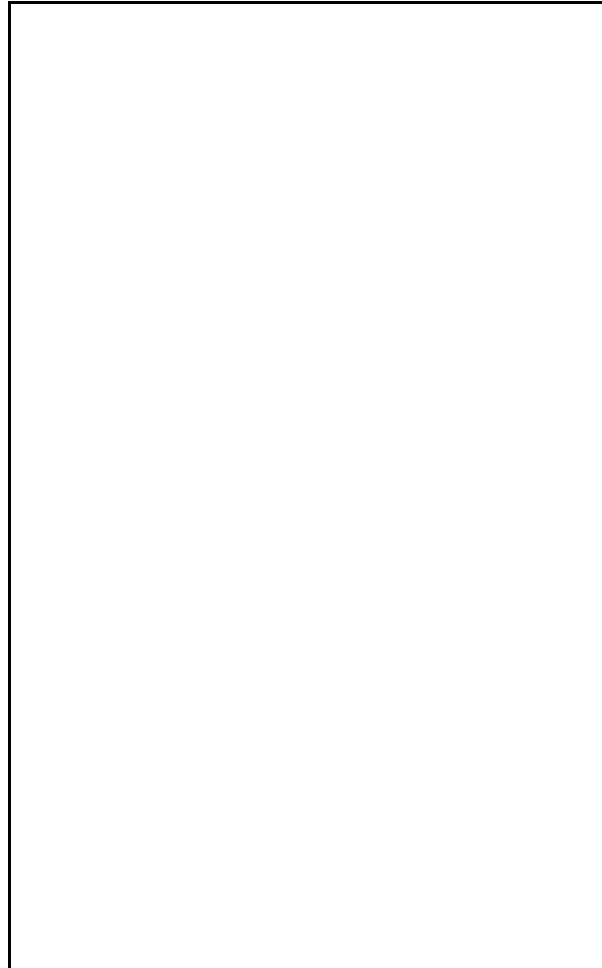
Q13. Jennie's council has a target of $\frac{1}{5}$ for households to recycle their waste.

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
(a)	$5.000 \div 8$	0.625	2	M1 for $5 \div 8$ or $1 \div 8 \times 5$ A1 cao
(b)	$\frac{14}{35} + \frac{5}{35}$ <u>Alternative</u> $0.4 + 0.143$	$\frac{19}{35}$ oe	2	M1 for correct common denominator of two fractions with at least one numerator correct $\frac{19}{35}$ oe (for example $\frac{38}{70}$) A1 for $\frac{19}{35}$ oe (for example $\frac{38}{70}$) <u>Alternative</u> M1 for 0.4 and 0.14(2857...) (correct to 2dp.) A1 for 0.54 or better
(c)	$\frac{5}{2} \times \frac{8}{5} = \frac{40}{10}$ <u>Alternative</u> 2.5×1.6	4	3	$\frac{5}{2}$ or $\frac{8}{5}$ oe M1 for $\frac{5}{2}$ or $\frac{8}{5}$ oe $\frac{5}{2} \times \frac{8}{5}$ M1 for $\frac{5}{2} \times \frac{8}{5}$ $\frac{40}{10}$ A1 for 4 oe (accept $\frac{40}{10}$) <u>Alternative</u> M1 For 2.5 and 1.6 M1 For 4 with any number of 0s with or without a decimal point A1 4
Total for Question: 7 marks				

M2.

Working	Answer	Mark	Additional Guidance
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$20 \div 5 (= 4)$ $20 - "4" (= 16)$ $"16" \times 1.50 (= 24)$	9	4	M1 for $20 \div 5$ M1 for $20 - "4"$ where $0 < "4" < 20$ M1 for $"16" \times 1.50$ where $0 < "16" < 20$ A1 cao
			Total for Question: 4 marks

M3.

Answer	Mark	Additional Guidance
$\frac{3}{20}$	2	M1 for clear attempt to multiply numerators and multiply denominators e.g. $\frac{3 \times 1}{5 \times 4}$ or $\frac{12 \times 5}{20 \times 20}$ A1 for $\frac{3}{20}$ oe
Total for Question: 2 marks		

M4.

Working	Answer	Mark	Additional Guidance
$\frac{1}{8} + \frac{6}{8}$	$\frac{7}{8}$		M1 for $\frac{6}{8}$ OR correct attempt to make fractions have a common denominator with at least one fraction correct OR for 0.125 and 0.75 seen

			A1 for $\frac{7}{8}$ oe or 0.875
Total for Question: 2 marks			

M5.

Working	Answer	Mark	Additional Guidance
$3600 \times 4 = 14400$ $\frac{2}{5} = 40\%$ $\frac{1}{4} = 25\%$ $30 + 40 + 25 = 95\%$ Saved 5% $10\% \text{ of } 14400 = 1440$ $5\% \text{ of } 1440 = 1440 \div 2$	£720	5	M1 3600×4 (= 14400) B1 for $\frac{2}{5} = 40\%$ or $\frac{1}{4} = 25\%$ M1 for $30\% + 40\% + 50\%$ (= 95%) M1 for complete method to find 5% of 14400 A1 cao OR M1 for 3600×4 (= 14400) B1 for $30\% = \frac{3}{10}$ M1 for $\frac{3}{10} + \frac{2}{5} + \frac{1}{4}$ (= $\frac{19}{10}$) oe M1 for complete method to find $\frac{1}{20}$ of 14400 A1 cao OR M1 3600×4 (= 14400) M1 for 0.3×14400 oe (= 4320) M1 for $\frac{2}{5} \times 14400$ oe (= 5760) M1 $14400 - 3600 - 4320 - 5760$ A1 cao SC if no other marks award M1 for 0.3×3600 (= 1080) M1 for $\frac{2}{5} \times 3600$ (= 1440)
Total for Question: 5 marks			

M6.

	Working	Answer	Mark	Additional Guidance
QWC (ii, iii)	$280 \times 0.175 + 280 (= 329)$	£315, Electrics	6	M1 for $50 + 10 \times 27$
FE	$420 \div 4 (= 315)$ $50 + 10 \times 27 (= 320)$			

Total for Question: 6 marks

M7.

Working	Answer	Mark	Additional Guidance
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Bethany	4
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Total for Question: 4 marks

M8.

	Working	Answer	Mark	Additional Guidance
(a)		$\frac{1}{4}$	1	B1 for $\frac{1}{4}$ or 0.25 or 4^{-1}
(b)	$(2 - 1) + \left(\frac{4}{5} - \frac{3}{4}\right)$ $= 1 + \left(\frac{16}{20} - \frac{15}{20}\right)$ or $\frac{14}{5} - \frac{7}{4} = \frac{56}{20} - \frac{35}{20} = \frac{21}{20}$ or $2.8 - 1.75$	$1\frac{1}{20}$	3	M1 for attempt to convert to fractions with common denominator, e.g. two fractions denominator 20 $\frac{16}{20} \quad \frac{15}{20}$ A1 correct conversion: $\frac{16}{20}$ and $\frac{15}{20}$ oe, $\frac{56}{20} \quad \frac{35}{20}$ or $\frac{56}{20}$ or $\frac{35}{20}$ oe $\frac{21}{20} \quad \frac{1}{20}$ A1 for $\frac{21}{20}$ or $1\frac{1}{20}$ OR M1 for $0.8 - 0.75$ (or $2.8 - 1.75$) A2 for 1.05 (A1 for 0.05)
(c)		Reason	1	B1 for correct reason, e.g. ' $1/3 = 0.3$ recurring (accept 0.33)' or ' $0.3 = 3/10$ '
				Total for Question: 5 marks

M9.

	Working	Answer	Mark	Additional Guidance
(a)	$\frac{4}{12} + \frac{1}{12}$	$\frac{5}{12}$	2	$\frac{4}{12}$ M1 for $\frac{4}{12}$ or for attempting to use a suitable common denominator other than 12, at least one of the two fractions correct. $\frac{5}{12}$ A1 for $\frac{5}{12}$ oe OR Attempt to use decimals, must use at least 2 d.p. M1 for 0.33(33...) + 0.08(33...) A1 for 0.416 recurring
(b)	$\frac{3 \times 1}{4 \times 5}$	$\frac{3}{20}$	1	$\frac{3}{20}$ B1 for $\frac{3}{20}$ oe
Total for Question: 3 marks				

M10.

Working	Answer	Mark	Additional Guidance
$\frac{14}{35} + \frac{5}{35}$ <u>Alternative</u> 0.4 + 0.143	$\frac{19}{35}$ oe	2	M1 for correct common denominator of two fractions with at least one numerator correct $\frac{19}{35}$ $\frac{38}{70}$ A1 for $\frac{19}{35}$ oe (for example $\frac{38}{70}$) <u>Alternative</u> M1 for 0.4 and 0.14(2857...) (correct to 2dp.) A1 for 0.54 or better
Total for Question: 2 marks			

M11.

	Working	Answer	Mark	Additional Guidance
(a)	$\frac{9}{600}$	$\frac{3}{200}$	2	$\frac{90}{600}$ M1 $\frac{90}{600}$ $\frac{3}{200}$ A1 $\frac{3}{200}$ cao [SC: B1 for 0.15 or 15% if M0 scored]
(b)	$\frac{180}{600} \times 100$ OR $\frac{180}{600} = \frac{30}{100}$	30	2	$\frac{180}{600} \times 100$ M1 $\frac{180}{600} \times 100$ A1 cao OR $\frac{180}{600} = \frac{30}{100}$ M1 $\frac{180}{600} = \frac{30}{100}$ or attempt to cancel to 100 A1 cao
(c)	$600 - (90 + 180) =$ 330 blue or green $330 \div 3$	110	2	M1 ["600 - (90 + 180)"] $\div 3$ A1 cao [SC: B1 for an answer of 140 or 170 if M0 scored]
Total for Question: 6 marks				

M12.

Working	Answer	Mark	Additional Guidance
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$$\frac{4}{5} \times 75 = 60 \quad 60 \div 5 = 12$$

$$3 \times 12 = 36$$

$$2 \times 12 = 24$$

Roger 24

4

Bethan 36

Total for Question: 4 marks

M13.

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

- E1.** (a) The many students who got this wrong fell mainly into 3 camps.. Those who did not know that to convert 85to a decimal requires the division of 5 by 8 or its equivalent, those that could not carry out the division and those who tried to work out $58 \div$. A small number of candidates tried to do a chunking method along the lines of $0.5 + 0.5 \div 4$ with the second part being worked out by repeated halving.
- (b) Responses to this straightforward question were often disappointing, with the usual errors of $2/5 + 1/7 = 3/12$ or $3/35 + 1/35 = 4/35$ appearing.
- (c) Many candidates were unaware of the standard method of multiplying mixed numbers by changing them to improper fractions. Of those that did write $5825 \times$ a surprising number went on to find either $5/2 \times 8/5$ (a confusion with division) or $25/10 \times 16/10 = 400/10$ (a confusion with addition)

- E2.** Once again a surprising number of candidates could not apply the appropriate arithmetical skills correctly. The major problem came with $16 \times \text{£}1.50$ with many candidates failing to see that the most direct way of working this out was to do $16 +$ half of 16. Some candidates were confused by the context and worked out one fifth of 15 and then used that answer in various inventive ways. Others found one fifth of 20 as 4 and then used that to get £6 as the profit, in this case ignoring most of the information given in the question. Many failed to complete the final step of the question which was performing a subtraction to calculate the profit.

- E3.** A standard, context free fraction multiplication with no cancelling required. As with question 1 there was a great deal of evidence pointing to poor arithmetical as well as conceptual/ process skills. The major error was where the multiplication process is

confused with addition, so the candidates write $\frac{12}{20} \times \frac{5}{20}$, making the denominators the same and then go on to work this out as $\frac{60}{20}$ or 3. (Of course, $\frac{60}{400}$ was an acceptable answer). Further common wrong answers were $\frac{17}{20}$ from adding the numerators of the

equivalent fractions and $\frac{4}{20}$ from possibly $3 \times 1 = 4$, or from simply multiplying the denominators of the original fractions and adding the numerators. Some clearly confused the methods required for multiplication and division and turned the second fraction upside down before multiplying to reach $\frac{12}{5}$. A few candidates replaced the fractions by decimals. They were allowed full marks on a correct decimal answer.

- E4.** This question was not done well. More than two thirds of the candidates scored 0 marks in this question. By far the most common incorrect approach was to simply add the numerators and add the denominators to get $4/12$. A significant number of those candidates using the tabular approach got confused somewhere in their method.

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Foundation

Another question which candidates preferred not to attempt. The significance of the £3600 was missed by nearly all the candidates who used this as figure for his salary, rather than $4 \times £3600$. Some credit was given for candidates who demonstrated $2/5$ and 30% of the £3600, but in too many cases these calculations were done badly. There were several different routes to the solution, including conversion to fractions, to decimals, or to percentages. This was again a question in which candidates had to order their work logically on the page in order for examiners to understand their order of calculations, and the chosen method of solution. Overall few marks were gained on this question. Centres need to emphasise at all opportunities the need for candidates to set out work logically and clearly.

Higher

Candidates need to be encouraged to set their work out in a logical order when tackling a multi-stage problem. Haphazard working led to loss of zeros, incorrect subtraction and candidates seeming to lose track of their method. Often when finding $2/5$ of 14400, candidates found $1/5$ but then did not carry on to double their answer. Many candidates knew how to find the correct proportions but were let down by poor multiplication skills. A significant number did not appreciate the detail of the question and found proportions of £3600 rather than £14400.

E8. In part (a), an increasing number of candidates are able to write down the reciprocal of a number. Common incorrect answers here were 2, 16 and 4/1. In part (b), most candidates were able to score at least 1 mark for writing the fractions with a common denominator (generally 20), but poor arithmetic often hindered candidates from gaining full marks, $14/5 - 7/4 = 46/20 - 35/20$ was a typical error. Those candidates who dealt with the integers and fractions separately, i.e. $(2 - 1) + (4/5 - 3/4)$, were a little more successful than those who converted the mixed numbers to improper fractions. In part (c), about half the candidates were able to write down a suitable reason for why Sundas was wrong. Most reasons were based either on $1/3 = 0.33\dots$ or on $3/10$ not being the same as $1/3$.

E9. The addition of fractions is a difficult topic for candidates at the Foundation tier and part (a) was answered poorly. Many candidates did not appreciate the need for a common denominator and the most common answer was $2/15$ from adding the numerators and adding the denominators. Even when candidates attempted to find a suitable common denominator, errors occurred in converting one or both of the fractions and some candidates, having correctly expressed both fractions with a common denominator, proceeded to add the denominators as well as the numerators. Candidates were more successful in part (b) with just under a half multiplying the two fractions correctly.

E10. This question was usually answered correctly, however a good proportion of the candidature failed to score full marks. Even at this level many candidates gave an incorrect answer of $3/12 = 1/4$, simply adding the numerators and denominators of the given fractions. Some, after finding a common denominator of 35, failed to correctly convert the numerators; $2/35 + 1/35$ or $10/35 + 7/35$ or $14/35 + 7/35$ were often seen.

On occasions, $\frac{19}{35} = 1\frac{16}{35}$ was seen, where the candidate had attempted a form of simplification after quoting the correct answer. Having seen the correct answer, full marks were awarded in these cases.

E11. In many cases in part (a), candidates gave a fraction of $\frac{90}{600}$ and then either failed to simplify it correctly or failed to complete the simplifying process.

Part (b) was quite poorly answered, many candidates misunderstanding the demand of the question and trying to find 180% of 600. Many tried partitioning methods and often statements like “10% = 60” were seen but solutions were unable to progress and no marks could be awarded.

In part (c), the most popular misconception was to divide 330 by 2 (instead of 3) and then to divide their answer by 2 again; 82.5 or similar being a common incorrect answer seen. Some candidates failed to take account of both the yellow and red counters already having been used, omitting usually just one of them, leading to an answer of 140 or 170. One mark was awarded in these cases.