Q1.

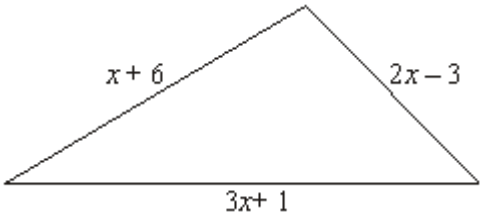


Diagram **NOT** accurately drawn

In the diagram, all measurements are in centimetres.

The lengths of the sides of the triangle are

$x + 6$
$2x - 3$
$3x + 1$

(a) Find an expression, in terms of x, for the perimeter of the triangle.

Give your expression in its simplest form.

.....

(2)

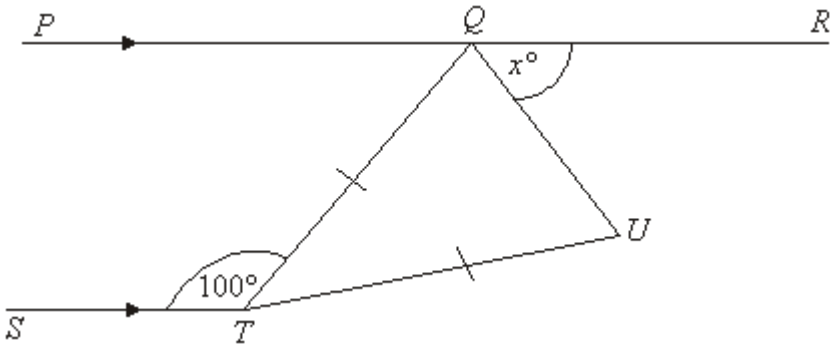
The perimeter of the triangle is 37 cm.

(b) Find the value of x.

x = ...

(2)
(Total 4 marks)

Q2.



PQR is a straight line parallel to *ST.*
QT = *UT*
Angle *STQ* = 100°.

Prove that angle *QTU* = (2*x* – 20)°.

(Total 5 marks)

Q3. David buys some stamps.
Each stamp costs 25p.
The total cost of the stamps is £3

(a) Work out the number of stamps David buys.

.....

(2)

Adam, Barry and Charlie each buy some stamps.
Adam buys x stamps.
Barry buys three times as many stamps as Adam.

(b) Write down an expression, in terms of x, for the number of stamps Barry buys.

.....

(1)

Charlie buys 5 more stamps than Adam.

(c) Write down an expression, in terms of x, for the number of stamps Charlie buys.

.....

(1)
(Total 4 marks)

Q4. (a) Simplify $4x + 3y - 2x + 5y$

.....

(2)

Compasses cost *c* pence each.
Rulers cost *r* pence each.

(b) Write down an expression for the total cost, in pence, of 2 compasses and 4 rulers.

..... pence

(2)
(Total 4 marks)

Q5. Compasses cost *c* pence each.
Rulers cost *r* pence each.

Write down an expression for the total cost, in pence, of 2 compasses and 4 rulers.

..... pence

(Total 2 marks)

M1.

	Working	Answer	Mark	Additional Guidance
(a)	$2x - 3 + x + 6 + 3x + 1$	$6x + 4$	2	**M1** for $2x - 3 + x + 6 + 3x + 1$ **or** $6x + k$ seen **A1** for $6x + 4$, condone P = $6x + 4$ but not $x = 6x + 4$ or $0 = 6x + 4$
(b)	$6x + 4 = 37$ $6x = 33$ $x = 5.5$	5.5	2	**M1** for "$6x + 4$" = 37, must be 3 term linear equation with coefficient of $x \neq 1$ **A1** for 5.5, $\frac{11}{2}$, $5\frac{1}{2}$ oe or ft for their "$6x + 4$" provided x is positive. **OR** **M1** for a correct 2 stage numerical process to find x **A1** for 5.5, $\frac{11}{2}$, $5\frac{1}{2}$ oe or ft for their "$6x + 4$" provided x is positive. T&I Allow 2 marks for 5.5oe , otherwise 0 (**SC B1** "$x + k = 37$" or "$kx = 37$) NB Do not award marks in (a) for $6x + 4$ in (b)
				Total for Question: 4 marks

M2.

	Working	Answer	Mark	Additional Guidance
QWC (i, ii, iii)	Angle RQT= 100° (alternate angles are equal)	Proof	5	**B1** for angle RQT = 100° **B1** for angle TQU = 100 – *x* or

	Angle TQU = 100 – x Angle QUT = 100 – x (base angles of isos triangle) Angle QTU = 180 – (100 – x + 100 – x) angles in a triangle)			angle QUT = 100 – x **B1** for completing the proof **C2** for all 3 reasons given **QWC: Proof should be clearly laid out with technical language correct, e.g. alternate angles are equal** [C1 for just 1 or 2 reasons given] **QWC: Proof should be clearly laid out with technical language correct, e.g. alternate angles are equal**
				Total for Question: 5 marks

M3.

	Working	Answer	Mark	Additional Guidance
(a)	300 ÷ 25	12	2	**M1** for 25 + 25 + 25 + ... or "3" ÷ 25 or £1 = 4 oe **A1** for 12 cao
(b)		$3x$	1	**B1** for $3x$ or $3 \times x$
(c)		$x + 5$	1	**B1** for x + 5 cao
				Total for Question: 4 marks

M4.

	Answer	Mark	Additional Guidance
(a)	$2x + 8y$	2	**B2** for $2x + 8y$ oe [**B1** for $2x$ or $8y$ seen] {Note:$-8y$ seen with no working gets **B0** $4x + 2x = 6x$ gets **B0**}
(b)	$2c + 4r$	2	**B2** for $2c + 4r$ oe [**B1** for $2c$ or $4r$ or seen] Ignore any Left Hand Side = $2c + 4r$ {Note: ignore units or use of 'p'}
			Total for Question: 4 marks

M5.

Answer	Mark	Additional Guidance
$2c + 4r$	2	**B2** for $2c + 4r$ oe [**B1** for $2c$ or $4r$ oe seen] Ignore any Left Hand Side = $2c + 4r$ {Note: ignore units or use of 'p'}
		Total for Question: 2 marks

E1. Foundation

A significant number of candidates were able to score at least 1 mark in this question.

In part (a), only the best candidates were able to add and simplify the three expressions to get the correct perimeter for the triangle.

Common errors include: not recognizing that the coefficient of x by itself is 1, so that $x + 2x + 3x$ was simplified to $5x$; ignoring the negative sign so that (+6) + (–3) + (+1) was simplified to 10; adding the constant terms to the terms in x, so that e.g. $6x + 4$ was simplified to $10x$; incomplete simplification (usually to $6x + 7 – 3$); unnecessary division by 2, so that $6x + 4$ was the simplified to $3x + 2$.

In part (b), few candidates put the expression they obtained in part (a) to form an equation in x. Of those that did, many had difficulty in dividing 33 by 6. A significant number of candidates used trial and improvement in the diagram to arrive at the correct answer for this part.

Higher

Many candidates were able to reach a correct simplified answer for a question that has now become common. Some candidates did not know the difference between a formula, an expression and an equation. Answers to part (a) of the form $P = 6x + 4$ (a formula) or $37 = 6x + 4$ (the start of part (b)) were not penalised, but $0 = 6x + 4$, $180 = 6x + 4$ and $x = 6x + 4$ all were.

Answers to part (b) were again marred by a lack of arithmetical skill.

The main stopping block being the division of 33 by 6, which often yielded 5.3 and where answers of 5 remainder 3 were not considered acceptable. Most candidates knew that they had to apply their answer to part (a) and set it equal to 37. Some used no algebra at all but showed a process that was clearly equivalent to subtracting 4 from 37 and the dividing the answer by 6. They got full marks if 5.5 or equivalent was obtained

E3. Part (a) was answered very well. Many candidates worked out that 4 stamps could be bought for £1 so therefore 12 could be bought for £3 and some showed division of 300 by 25. Some made simple mistakes such as 5 stamps for £1, leading to an answer of 15, or 4 for £1, 8 for £2 so 16 for £3. Common incorrect methods were 25 ÷ 3 and 25 × 3. Part (b) was answered less well but nevertheless more than half of the candidates were able to

give the correct expression. A common incorrect answer was x^3. Some candidates, not appreciating that an expression was required, wrote $x = 3x$ which gained no credit. In part (c) the correct answer was seen less often. Many incorrect expressions had 5 being multiplied by x rather than added to it and some candidates added 5 to Barry's amount rather than to Adam's amount.

E4. Part (a) was answered very well by most candidates. For some, the signs caused a problem with $2x - 8y$ being the most common incorrect answer. Most candidates were also successful in part (b). Some, though, wrote down $2c + 4r$ in their working and then made this equal to $6cr$, or even $8cr$, and lost a mark. A few candidates gave the answer as $c^2 + r^4$. Many candidates did not know the difference between an expression and an equation but they were not penalised for this.

E5. Many candidates gained at least one mark in this question for quoting either $2c$ or $4r$ or their equivalences. However $c^2 + r^4$ and $6cr$ were common mistakes.

$2c = c^2$ showing a basic misconception was also seen.