

**Q1.**  $P = 3a + 2b^2$

- (a) Find the value of  $P$  when  $a = 5$  and  $b = -4$

.....

(2)

- (b) Make  $a$  the subject of the formula.

.....

(2)

(Total 4 marks)

- Q2.** This rule is used to work out the total cost, in pounds, of hiring a carpet cleaner.

Multiply the number of days' hire by 4

Add 6 to your answer

Peter hires a carpet cleaner.  
The total cost is £18

- (a) Work out for how many days he hires the carpet cleaner.

..... days

(2)

- (b) Write down an expression, in terms of  $n$ , for the total cost, in pounds, of hiring a carpet cleaner for  $n$  days.

.....

(2)

(Total 4 marks)

**Q3.**  $v^2 = u^2 + 2as$

$$u = 6$$

$$a = 2.5$$

$$s = 9$$

- (a) Work out a value of  $v$ .

$v =$  .....

(3)

(b) Make  $s$  the subject of the formula  $v^2 = u^2 + 2as$

$s = \dots\dots\dots$

(2)  
(Total 5 marks)

M1.

	Working	Answer	Mark	Additional Guidance
(a)	$3 \times 5 + 2 \times (-4)^2$ $15 + 2 \times 16$ $15 + 32$	47	2	<b>M1</b> for $3 \times 5 + 2 \times (-4)^2$ <b>A1</b> for 47
(b)	$P - 2b^2 = 3a$ $a = (P - 2b^2) \div 3$	$a = \frac{P - 2b^2}{3}$	2	<b>M1</b> for $P - 2b^2 = 3a$ <b>A1</b> cao
<b>Total for Question: 4 marks</b>				

M2.

	Working	Answer	Mark	Additional Guidance
(a)	$(18 - 6) \div 4$	3	2	<b>M1</b> for $18 - 6$ or 12 or $3 \times 4 + 6$ or $4n + 6 = 18$ or 10, 14, 18 seen <b>A1</b> for 3 cao
(b)		$4n + 6$	2	<b>B2</b> for $4n + 6$ or (cost = ) $4n + 6$ <b>(B1</b> for $4n + a$ or $bn + 6$ , where $a$ and $b$ are numbers ( $b \neq 0$ ) or $n = 4n + 6$ or $4n + 6 = 18$ or £ $4n + 6$ or $4x + 6$ )
<b>Total for Question: 4 marks</b>				

M3.

	Working	Answer	Mark	Additional Guidance
(a)	$v^2 = 6^2 + 2 \times 2.5 \times 9$	9	3	<p><b>M1</b> for correct substitution giving <math>6^2 + 2 \times 2.5 \times 9</math> or better</p> <p><b>M1</b> (dep) for <math>\sqrt{81}</math></p> <p><b>A1</b> cao accept <math>\pm 9</math></p> <p>[SC: <b>B1</b> for answer of 81 if M0 scored]</p>
(b)	$v^2 - u^2 = 2as$  <b>OR</b> $\frac{v^2}{2a} = \frac{u^2}{2a} + s$	$\frac{v^2 - u^2}{2a}$ oe	2	<p><b>B2</b> for <math>\frac{v^2 - u^2}{2a}</math> oe</p> <p>(<b>B1</b> for <math>v^2 - u^2 = 2as</math> oe or <math>\frac{v^2}{2a} = \frac{u^2}{2a} + s</math> oe)</p> <p>Examples:</p> <p><math>s = \frac{v^2 - u^2}{2} \div a</math> gets <b>B2</b></p> <p><math>s = \frac{v^2 + u^2}{2a}</math> gets <b>B1</b></p> <p><math>s = v^2 - u^2 - 2a</math> without the intermediate</p> <p><math>2as = v^2 - u^2</math> gets B0</p>
				<b>Total for Question: 5 marks</b>

**E2.** This question was done well by most of the candidates. In part (a), the vast majority of candidates were able to find the number of days hire of the carpet cleaner. Usually by the reverse process  $18 - 6 = 12$  and then dividing this by 4, but some by setting up and solving the equation  $4n + 6 = 18$ . In part (b), most of the candidates were able to write down a suitable expression for the total cost of hire for  $n$  days, but some wrote this incorrectly as  $n = 4n + 6$  or in the rearranged form as  $n = (C - 6)/4$ .

**E3.** Substitution of the values of the three variables was usually good in part (a) but subsequent calculation was not.  $6^2$  was often seen evaluated as 12,  $2 \times 2.5 \times 9$  seen was often followed by  $5 \times 18$ . Another very common mistake was to work out  $2 \times (2.5 + 9)$ .

On the occasions when the arithmetic was more accurate, some candidates failed to realise the need to find the square root, giving 81 as their answer, and some simply divided 81 by 2 as their attempt to solve  $v^2 = 81$

Many candidates, in part (b), failed to understand the demand of the question and used information from part (a) to attempt a solution.

Those candidates using 'input' and 'output' machines often made errors either when dealing with the coefficient of  $s$ ; separating the 2 and a incorrectly, or in the order of operations.