| Question Number | Scheme | Marks |
|---|---|---|
| **3(a)** | $1.05 = 3p + q$<br>$1.65 = 5p + q$<br><br>e.g. $\Rightarrow 2p = 0.6$ or $\Rightarrow 1.05 = 3p + (1.65 - 5p)$ or $\Rightarrow 1.65 = 5p + (1.05 - 3p)$<br><br>$p = 0.3 \quad q = 0.15$ | M1<br><br>A1A1 |
| | | **(3)** |
| **(b)** | $2.5 = "0.3"T + "0.15" \Rightarrow T =$<br><br>$T = 7.8$ | M1<br><br>A1 |
| | | **(2)** |
| | | **(5 marks)** |

**(a)**

M1 Forms two simultaneous equations (which may be in pence) and proceeds to find a value for $p$ or $q$
May be implied by a correct $p$ or $q$ (allow sight of 30 or 15).
Also score for an attempt to calculate $\frac{1.65 - 1.05}{5 - 3}$ or equivalent.

A1 $p = 0.3$ or $q = 0.15$ oe

A1 $p = 0.3$ and $q = 0.15$ oe

**(b)**

M1 Uses their values for $p$ and $q$ with $V = 2.5$ and rearranges to find a value for $T$. It must come from $\frac{2.5 \pm q}{p}$ which you may need to check on your calculator, allowing for truncation or rounding (eg 8 following correct values for $V$, $p$ and $q$)

A1 7.8 cao isw after sight of the correct answer.

| Question Number | Scheme | Marks |
|---|---|---|
| **4(a)** | $x^2(2x+1)-15x \Rightarrow 2x^3+x^2-15x = x(2x^2+x-15)$ | M1 |
| | $x(2x-5)(x+3)=0 \Rightarrow x=...$ | dM1 |
| | Two of $x=0,\ \frac{5}{2},\ -3$ | B1 |
| | $x=0,\ \frac{5}{2},\ -3$ | A1 |
| | | **(4)** |
| **(b)** | $y^{\frac{2}{3}} = \frac{5}{2} \Rightarrow y = \left(\frac{5}{2}\right)^{\frac{3}{2}}$ | M1 |
| | $\frac{5}{4}\sqrt{10}$ | A1cso |
| | | **(2)** |
| | | **(6 marks)** |

**The question says "In this question you must show detailed reasoning. Solutions relying on calculator technology are not acceptable". Correct answers do not imply full marks.**

**(a)**

M1 Multiplies out the bracket to achieve a cubic, takes out a linear factor or cancels the $x$ leading to a quadratic factor (usually $2x^2+x-15$). Award for $...x(...x^2 \pm ...x \pm ...)$ or $...x(...x \pm ...)(...x \pm ...)$ May be implied by eg $x(2x-5)(x+3)$ May see = 0 or may be implied.

dM1 Attempts to solve their quadratic either by factorising or using the quadratic formula or completing the square. They cannot just state the roots and the fully factorised version or values of *a*, *b* and *c* must match their quadratic. It is dependent on the previous method mark. The = 0 can be implied and the factorised quadratic may appear under their solutions.

B1 Two of $x=0,\ \frac{5}{2},\ -3$

A1 $x=0,\ \frac{5}{2},\ -3$ provided all previous marks have been scored. Check for $x=0$ in earlier work

Eg1 $2x^3+x^2-15x = x(2x-5)(x+3) \Rightarrow 0,\ \frac{5}{2},\ -3$ M1dM1B1A1

Eg2 $2x^3+x^2-15x=0 \Rightarrow x^3+\frac{1}{2}x^2-\frac{15}{2}x=0 \Rightarrow x\left(x-\frac{5}{2}\right)(x+3)=0 \Rightarrow 0,\ \frac{5}{2},\ -3$ M1dM1B1A1

Eg3 $2x^3+x^2-15x = x\left(x-\frac{5}{2}\right)(x+3) \Rightarrow 0,\ \frac{5}{2},\ -3$ M1dM0B1A0 (the cubic and factorised version are not equal to each other)

Eg4 $2x^3+x^2-15x = x(2x^2+x-15) \Rightarrow 0,\ \frac{5}{2},\ -3$ M1dM0B1A0 (no method seen to solve the quadratic)

Eg5 $0,\ \frac{5}{2},\ -3$ M0dM0B1A0 (no method seen at all)