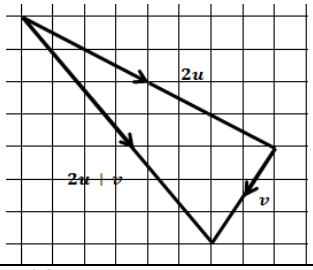
Paper A Calculator Solutions

Qu	Marking Guidance	Illustration
1.	• Correct expansion • Simplified form	• $2x^3 - x^2 + 5x - 6x^2 + 3x - 15$ • $2x^3 - 7x^2 + 8x - 15$
2.	• Prepares to multiply • Final answer in simplified form	• $\frac{27}{7} \times \frac{5}{12} = \frac{9}{7} \times \frac{5}{4}$ • $\frac{45}{28}$
3.	• Value of p • Value of q	• $(x + 3)^2 \ldots$ • $\ldots - 13$
4.	• Rearranges to $y = mx + c$ • Gradient • y-intercept	• $y = -\frac{5}{3}x - 4$ • $m = -\frac{5}{3}$ • $(0, -4)$
5.	• Correctly substitution • Simplifies quadratic formulae • Value 1 • Value 2 *must be rounded correctly	• $\frac{7 \pm \sqrt{(-7)^2 - 4 \times 2 \times (-5)}}{2 \times 2}$ • $\frac{7 \pm \sqrt{89}}{4}$ • $x = 4.1$ • $x = -0.61$
6.	• Finds how many $0.05ml$ required • Calculation • Final answer	• $1000 \div 0.05 = 20\,000$ • $20000 \times 2 \times 10^{21}$ • 4×10^{25}
7.	• Calculation • Area of one triangle • Knows to multiply by 6 • Final answer *must have units	• $A = \frac{1}{2} \times 40 \times 40 \times \sin 60$ • $A = 692.8$ • 692.8×6 • $4156.92cm^2$
8.	• Correct use of sine rule • Begins to find x^0 • Final answer	• $\frac{\sin x}{5.4} = \frac{\sin 80}{8.6}$ • $\sin x = \frac{5.4 \times \sin 80}{8.6}$ • $x = 38.2^0$
9.	• Correct use of discriminant • Finds value of discriminant • Final statement	• $20^2 - 4 \times 4 \times 25$ • $400 - 400 = 0$ • Since $b^2 - 4ac = 0$ $y = 4x^2 + 20x + 25$ has two real and distinct roots.
10.	• Height of the cone • Volume of the cone • Knows how to find the volume of hemisphere • Volume of hemisphere • Total Volume	• $V_{cone} = \frac{1}{3} \times \pi \times 3.5^2 \times 8.5$ • $V_{cone} = 109.04cm^3$ • $V_{hemi} = \frac{4}{3} \times \pi \times 3.5^3 \div 2$ • $V_{hemi} = 89.80cm^3$ • $Total = 198.84cm^3$
11.	• Correct multiplier • Correct calculation • Final answer	• 1.018 • 3000×1.018^5 • £3279.90
12.	• Rearranges to $\tan x$ • Finds related angle • Final answer	• $\tan x = \frac{2}{3}$ • $RA \rightarrow x = 33.69^0$ • $x_1 = 33.69^0, x_2 = 213.69^0$

13.	• Correctly sketches $2u$ • Correctly sketches v • Sketches $2u + v$	• 
	• Components of $2u - v$ • Begins to find magnitude • Final answer	• $\begin{pmatrix}10\\-1\end{pmatrix}$ • $\sqrt{10^2 + (-1)^2}$ • 10.05
14.	• Finds the mean • Finds the numerator • Calculation • Final answer	• $\bar{x} = 8.5$ • $\sum(x - \bar{x})^2 = 29.5$ • $\sqrt{\frac{29.5}{5}}$ • 2.43
15	• Correct answer	• $C = (6, 9, 0)$
	• Correct answer	• $V = (3, 6, 8)$
	• Knows how to find the distance • Begins to solve • Final answer	• $\sqrt{(-3)^2 + (-3)^2 + 8^2}$ • $\sqrt{82}$ • $9.06\ units$
16.	• Correct calculation • Begins to solve • Final answer	• $63.62 = \frac{x}{360} \times \pi \times 9^2$ • $x = \frac{63.62 \times 360}{\pi \times 81}$ • $x = 90^0$
	• Fractions • Calculation • Arc Length • Final answer *must have units	• $\frac{90}{360}$ • $\frac{90}{360} \times \pi \times 18$ • $14.71cm$ • $25 \times 15 = £400$