

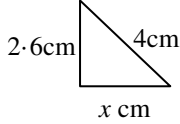
Qu	Give one mark for each •	Illustrations for awarding mark
1	ans: $m = \frac{3}{2}; (0, -4)$ 3 marks <ul style="list-style-type: none"> •¹ rearranges equation •² states gradient •³ states y - intercept 	<ul style="list-style-type: none"> •¹ $y = \frac{3}{2}x - 4$ •² $m = \frac{3}{2}$ •³ $(0, -4)$
2	ans: $x < -1$ 3 marks <ul style="list-style-type: none"> •¹ expands brackets •² collects like terms •³ solves for x 	<ul style="list-style-type: none"> •¹ $3x + 6 - 4 > 5x + 8$ •² $-6 > 2x$ or $-2x > 6$ •³ $x < -3$
3	ans: 50 2 marks <ul style="list-style-type: none"> •¹ recognises difference of two squares •² answer 	<ul style="list-style-type: none"> •¹ $(13.5 + 11.5)(13.5 - 11.5)$ •² $25 \times 2 = 50$
4	ans: $d = \sqrt{\frac{3S}{c}}$ 3 marks <ul style="list-style-type: none"> •¹ multiplies through by 3 •² divides by c •³ takes square root 	<ul style="list-style-type: none"> •¹ $3S = cd^2$ •² $d^2 = \frac{3S}{c}$ •³ $d = \sqrt{\frac{3S}{c}}$
5a	ans: 1 3 marks <ul style="list-style-type: none"> •¹ simplifies numerator •² simplifies fraction •³ evaluates x^0 	<ul style="list-style-type: none"> •¹ x^{-2} •² x^0 •³ 1
b	ans: 8 3 marks <ul style="list-style-type: none"> •¹ substitutes •² knows meaning of fractional index •³ final answer 	<ul style="list-style-type: none"> •¹ $\frac{1}{2} \times 64^{\frac{2}{3}}$ •² $\frac{1}{2} \times \sqrt[3]{64^2}$ •³ 8
6a	ans: $\frac{9(7 - \sqrt{2})}{47}$ 3 marks <ul style="list-style-type: none"> •¹ multiplies by fraction •² correct numerator •³ completes fraction 	<ul style="list-style-type: none"> •¹ $\dots \times \frac{\sqrt{2}}{\sqrt{2}}$ •² $\frac{5\sqrt{2} + \sqrt{6}}{\dots}$ •³ $\frac{5\sqrt{2} + \sqrt{6}}{2}$
b	ans: $5\sqrt{7}$ 2 marks <ul style="list-style-type: none"> •¹ multiplies surds •² simplifies surd 	<ul style="list-style-type: none"> •¹ $\sqrt{175}$ •² $5\sqrt{7}$

Qu	Give one mark for each •	Illustrations for awarding mark
7	ans: (3, 3); minimum 4 marks • ¹ starts to complete the square • ² completes process • ³ states turning point • ⁴ states nature	• ¹ $(x-3)^2 - 9...$ • ² $(x-3)^2 - 9 + 12 = (x-3)^2 + 3$ • ³ (3, 3) • ⁴ minimum
8	ans: $a = 3; b = 90^\circ; c = -1$ 3 marks • ¹ states value of a • ² states value of b • ³ states value of c	• ¹ $a = 3$ • ² $b = 90^\circ$ • ³ $c = -1$
9a	ans: discriminant > 0 1 mark • ¹ correct statement	• ¹ $b^2 - 4ac > 0$
b	ans: $k < 0$ 1 mark • ¹ correct statement	• ¹ $k < 0$
10	ans: $\frac{39 - 2x}{(x-6)(x+3)}$ 3 marks • ¹ correct denominator • ² correct numerator • ³ simplifies numerator	• ¹ $(x-6)(x+3)$ • ² $3(x+3) - 5(x-6)$ • ³ $39 - 2x$
11	ans: 61.8cm 6 marks • ¹ strategy • ² knows how to find inner arc • ³ finds inner arc • ⁴ knows how to find outer arc • ⁵ finds outer arc • ⁶ total perimeter	• ¹ finds two arcs and addition • ² $120/360 \times 3 \cdot 14 \times 24$ • ³ 25.12cm • ⁴ $120/360 \times 3 \cdot 14 \times 36$ • ⁵ 37.68cm • ⁶ $25 \cdot 12 + 37 \cdot 68 + 12 = 74 \cdot 8\text{cm}$
		Total 40 marks

Qu	Give one mark for each •	Illustrations for awarding mark
1	ans : $6x^3 - 29x^2 + 21x - 4$ 3 marks <ul style="list-style-type: none"> •¹ three terms correct •² further three terms correct •³ simplifies 	<ul style="list-style-type: none"> •¹ $6x^3 - 27x^2 + 12x \dots$ •² $\dots - 2x^2 + 9x - 4$ •³ $6x^3 - 29x^2 + 21x - 4$ [must have x^3 term]
2	ans : 6.59×10^4 kg 3 marks <ul style="list-style-type: none"> •¹ uses correct calculation •² answer in grams or kilograms •³ answer in Scientific Notation correctly rounded 	<ul style="list-style-type: none"> •¹ $3 \times 10^6 \times 21.95$ •² 65850000g or 65850kg •³ 6.59×10^4 kg
3	ans: 28° 3 marks <ul style="list-style-type: none"> •¹ recognises isosceles triangle •² knows angles QPR and OPS are right •³ states size of angle SPR explicitly 	<ul style="list-style-type: none"> •¹ angle QPO = 28° •² angle QPR = angle OPS = 90° •³ angle SPR = 28°
4a	ans: 20 2 marks <ul style="list-style-type: none"> •¹ substitutes value •² answer 	<ul style="list-style-type: none"> •¹ $2(3^2) + 7(3) - 19$ •² 20
b	ans : $3/2$ 4 marks <ul style="list-style-type: none"> •¹ changes variable and equates to -4 •² collects terms to LHS and equates to zero •³ factorises •⁴ solves and discards 	<ul style="list-style-type: none"> •¹ $2d^2 + 7d - 19 = -4$ •² $2d^2 + 7d - 15 = 0$ •³ $(2d - 3)(d + 5) = 0$ •⁴ $d = 3/2$ or -5
5	ans : not square with reason 3 marks <ul style="list-style-type: none"> •¹ strategy •² checks squares of sides •³ conclusion with reason 	<ul style="list-style-type: none"> •¹ evidence of converse of Pythagoras •² $4 \cdot 2^2 + 3 \cdot 8^2 = 32 \cdot 08$; $5 \cdot 6^2 = 31 \cdot 36$ •³ not square since $32 \cdot 08 > 31 \cdot 36$

Qu	Give one mark for each ●	Illustrations for awarding mark
6a	ans: $3d + 5s = 886$ 1 mark ● ¹ constructs equation	● ¹ $3d + 5s = 886$ [or 8·86]
b	ans: $5d + 2s = 875$ 1 mark ● ¹ constructs equation	● ¹ $5d + 2s = 875$ [or 8·75]
c	ans: £9.28 4 marks ● ¹ knows to use system of equation ● ² finds correct value for s ● ³ finds correct value for d ● ⁴ finds cost	● ¹ evidence of scaling equations ● ² $s = 95$ [or 0·95] ● ³ $d = 137$ [or 1·37] ● ⁴ £9.28 [accept 928p]
7a	ans: 1100cm³ 3 marks ● ¹ knows to find volume of cone ● ² finds volume of cone ● ³ rounds correctly	● ¹ $V_{cone} = \frac{1}{3} \times \pi \times 8^2 \times 16$ ● ² = 1072·33..... ● ³ 1100cm ³
b	ans: not enough since 832 > 800 4 marks ● ¹ strategy ● ² finds volume of sphere ● ³ finds volume of space ● ⁴ conclusion	● ¹ finds volume of sphere and subtracts ● ² $V_{sphere} = \frac{4}{3} \times \pi \times 4^3 = 268 \text{ cm}^3$ ● ³ 832cm ³ ● ³ not enough since 832 > 800
8	ans: 143·1°, 216·9° 4 marks ● ¹ solves for $\cos x^\circ$ ● ² finds relative angle ● ³ finds one solution ● ⁴ finds second solution	● ¹ $\cos x^\circ = -4/5$ ● ² 36·9° ● ³ 143·1° ● ⁴ 216·9°

Unrounded answer must be stated and correct units should also be stated.

Qu	Give one mark for each •	Illustrations for awarding mark
9	ans: 169·56ml 3 marks <ul style="list-style-type: none"> •¹ finds linear scale factor for reduction •² finds volume scale factor •³ multiplies by VSF to answer 	<ul style="list-style-type: none"> •¹ 3/5 •² (3/5)³ •³ (3/5)³ × 785 = 169·56ml
10	ans : -3·89, 0·39 5 marks <ul style="list-style-type: none"> •¹ equates equation to 0 •² knows to use quadratic formula •³ calculates $b^2 - 4ac$ •⁴ subs correctly into formula •⁵ states both roots correctly rounded 	<ul style="list-style-type: none"> •¹ $2x^2 + 7x - 3 = 0$ •² evidence •³ 73 •⁴ $\frac{-7 \pm \sqrt{73}}{2 \times 2}$ •⁵ -3·89, 0·39
11	ans: 650 3 marks <ul style="list-style-type: none"> •¹ starts to follow pattern •² completes pattern •³ carries out calculation 	<ul style="list-style-type: none"> •¹ $24 \times 13 \dots\dots$ •² $(24 \times 13 \times 25)/12$ •³ 650
12	ans : 6·08cm 4 marks <ul style="list-style-type: none"> •¹ assembles facts in right triangle •² knows to use Pythagoras' •³ uses Pythagoras' correctly •⁴ finds width 	 <ul style="list-style-type: none"> •¹ •² $x^2 = 4^2 - 2.6^2$ •³ $x = 3.04$ •⁴ $w = 6.08\text{cm}$
		Total 50 marks