1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)	$5w - 8 = 3(4w + 2)$ $5w - 8 = 12w + 6$ $-8 - 6 = 12w - 5w$ $-14 = 7w$	-2	3	M1 for attempting to multiply both sides by 3 as a first step (this can be implied by equations of the form $5w - 8 = 12w + ?$ or $5w - 8 = ?w + 6$ i.e. the LHS must be correct M1 for isolating terms in w and the number terms correctly from $aw + b = cw + d$ A1 cao **OR** M1 for $\frac{5w}{3} - \frac{8}{3} = 4w + 2$ M1 for isolating terms in w and the number terms correctly A1 cao
	(b)		$(x + 7)(x - 7)$	1	B1 cao
	(c)		$3x^4y^{\frac{3}{2}}$	2	B2 for $3x^4y^{\frac{3}{2}}$ or $3x^4y^{1.5}$ or $3x^4y^{1\frac{1}{2}}$ (B1 for any two terms correct in a product eg. $3x^4y^n$)

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
2		$\cos x = \frac{6.4}{9.6}$ $x = \cos^{-1}\frac{6.4}{9.6} =$	48.2	3	M1 for $\cos x = \frac{6.4}{9.6}$ or $\cos x = 0.66(6...)$ or $\cos x = 0.67$ M1 for $\cos^{-1}\frac{6.4}{9.6}$ or $\cos^{-1} 0.66(6...)$ or $\cos^{-1} 0.67$ A1 for 48.1 – 48.2 OR Correct use of Pythagoras and then trigonometry, no marks until M1 for $\sin x = \frac{'7.155'}{9.6}$ or $\tan x = \frac{'7.155'}{6.4}$ or $\sin x = \frac{'7.155'}{9.6} \times \sin 90$ or $\cos x = \frac{6.4^2 + 9.6^2 - '7.155'^2}{2 \times 6.4 \times 9.6}$ M1 for $\sin^{-1}\frac{'7.155'}{9.6}$ or $\tan^{-1}\frac{'7.155'}{6.4}$ or $\sin^{-1}\left(\frac{'7.155'}{9.6} \times \sin 90\right)$ or $\cos^{-1}\left(\frac{6.4^2 + 9.6^2 - '7.155'^2}{2 \times 6.4 \times 9.6}\right)$ A1 for 48.1 – 48.2 SC B2 for 0.841... (using rad) or 53.5... (using grad)

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
3		25 ÷ 50 = 0.5 h = 30 min 25 ÷ 60 = 0.416 h = 25 min	5	3	M1 for 25 ÷ 50 or $\frac{60}{50}\times 25$ or 30 (min) or 0.5(h) or 25 ÷ 60 or $\frac{60}{60}\times 25$ or 25 (min) or 0.41(6)(h) or 0.42 (h) M1(dep) '0.5' – '0.416' or '30' – '25' A1 cao OR M1 for 60 ÷ 25 (= 2.4) and 60 ÷ "2.4" or 50 ÷ 25 (= 2) and 60 ÷ "2" M1(dep) '30' – '25' A1 cao

<table>
<tr><th colspan="6">1MA0 Higher Tier – Practice Paper 2H (Set D)</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>4</td><td>(a)</td><td></td><td>show</td><td>2</td><td>M1 for x×x×x or 2×5× x or vol of cube = x3 or
vol cuboid = 10x
A1 correct completion leading to $x^3 - 10x = 100$</td></tr>
<tr><td></td><td>(b)</td><td><table>
<tr><td>$x = 1$</td><td>−9</td></tr>
<tr><td>$x = 2$</td><td>−2</td></tr>
<tr><td>$x = 3$</td><td>−3</td></tr>
<tr><td>$x = 4$</td><td>24</td></tr>
<tr><td>$x = 5$</td><td>75</td></tr>
<tr><td>$x = 6$</td><td>156</td></tr>
<tr><td>$x = 10$</td><td>900</td></tr>
<tr><td>$x = 5.1$</td><td>81.(651)</td></tr>
<tr><td>$x = 5.2$</td><td>88.(608)</td></tr>
<tr><td>$x = 5.3$</td><td>95.(877)</td></tr>
<tr><td>$x = 5.4$</td><td>103.(464)</td></tr>
<tr><td>$x = 5.5$</td><td>111.(375)</td></tr>
<tr><td>$x = 5.6$</td><td>119.(616)</td></tr>
<tr><td>$x = 5.7$</td><td>128.(193)</td></tr>
<tr><td>$x = 5.8$</td><td>137.(112)</td></tr>
<tr><td>$x = 5.9$</td><td>146.(379)</td></tr>
<tr><td>$x = 5.35$</td><td>99.6(30375)</td></tr>
<tr><td>$x = 5.36$</td><td>100.3(90656)</td></tr>
<tr><td>$x = 5.355$</td><td>100.0(101139)</td></tr>
</table></td><td>5.4</td><td>4</td><td>B2 for a trial $5 \leq x \leq 6$ evaluated correctly
(B1 for any two trials evaluated correctly for positive values of x)
B1 for a different trial $5.3 < x < 5.4$ evaluated correctly
B1 (dep on at least one previous B1) for 5.4

Accept trials correct to the nearest whole number (rounded or truncated) if the value of x is to 1 d.p.,
but correct to 1 d.p. (rounded or truncated) if the value of x is to 2 or more d.p.

NB. Allow 100 for a trial of x = 5.355</td></tr>
</table>

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)		$(y-8)(y-2)$	2	M1 (y ± 8)(y ± 2) or y(y − 2) − 8(y − 2) or y(y − 8) − 2(y − 8) A1 cao
	(b)(i)	$2t^2+5t+2$ = $(2t+1)(t+2)$	$(2t+1)(t+2)$	3	M1 (2t + 2)(t + 1) oe or 2t(t + 2) + 1(t + 2) or t(2t + 1) + 2(2t + 1) A1 $(2t+1)(t+2)$
	(ii)	This is always a product of two whole numbers each of which is greater than 1	Correct explanation		B1 ft from (i) for a convincing explanation referring to factors found in (i)
6		$\sin 60^o = \frac{x}{32}$ $x = 32 \times \sin 60$ (=27.712...)	27.7	3	M1 sin 60 = $\frac{x}{32}$ or $\frac{x}{\sin 60} = \frac{32}{\sin 90}$ oe M1 (x =) 32 × sin 60 or (x =) $\frac{32}{\sin 90} \times \sin 60$ A1 27.7 − 27.72 OR M1 cos(90 − 60) = $\frac{x}{32}$ M1 (x =) 32 × cos(90 − 60) A1 27.7 − 27.72

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
7		BD2 + 122 = 162 oe BD= $\sqrt{256-144}$ (=10.58...) sin 40 = $\frac{'10.58'}{CD}$ CD = $\frac{'10.58'}{\sin 40}$	16.5	5	M1 for BD2 + 122 = 162 oe or 162 – 122 or 112 seen M1 for $\sqrt{256-144}$ or $\sqrt{112}$ (=10.58...) M1 for sin 40 = $\frac{'10.58'}{CD}$ or cos 50 = $\frac{'10.58'}{CD}$ M1 for (CD =) $\frac{'10.58'}{\sin 40}$ or $\frac{'10.58'}{\cos 50}$ A1 for 16.4 – 16.5 OR M1 for BD2 + 122 = 162 oe or 162 – 122 or 112 seen M1 for $\sqrt{256-144}$ or $\sqrt{112}$ (=10.58..) M1 for (BC =) '10.58'× tan 50 or $\frac{'10.58'}{\tan 40}$ (=12.6…) M1 for $\sqrt{'12.6'^2+'10.58...'^2}$ A1 for 16.4 – 16.5
8		$\frac{64.8-59.3}{64.8}\times 100$ (=8.487...) OR $\frac{59.3}{64.8}\times 100$ = 91.512 100 – '91.512' =8.487...)	8.49	3	M1 64.8 − 59.3 (=5.5) M1 (dep) $\frac{'5.5'}{64.8}\times 100$ oe A1 8.48 – 8.49 OR M1 $\frac{59.3}{64.8}\times 100$ oe (= 91.5(12...)) M1 (dep) 100 – '91.5' A1 8.48 – 8.49

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
9		$3y - 2 > 5$ $3y > 7$	$y > \frac{7}{3}$	2	M1 for clear intention to add 2 to both sides (of inequality or equation) or clear intention to divide all three terms by 3 or $3y > 7$ or $3y < 7$ or $3y = 7$ A1 $y > \frac{7}{3}$ or $y > 2\frac{1}{3}$ or $y > 2.\dot{3}$ NB. final answer must be an inequality (SC B1 for $\frac{7}{3}$ oe seen if M0 scored)
10	(a)(i)	Explanation : Each member of the population has an equal chance of selection	Each member of the population has an equal chance of selection	2	B1 for explanation
	(ii)	Description : Eg. number each student and use random select on a calculator	Valid method		B1 for an acceptable description
	(b)	239+257+248+190+206=1140 $\frac{239}{1140} \times 100$	21	2	M1 for $\frac{239}{1140} \times 100$ oe or 20.96… A1 cao

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
11		Volume = $\frac{5\times12}{2}\times15$ Mass = $\frac{5\times12}{2}\times15\times6.6$	2970	3	M1 $\frac{5\times12}{2}\times15$ (=450) M1 (dep on 1st M1) $'450'\times6.6$ A1 cao SC: If no marks awarded then award B1 for an answer of 5940
12			Translation by $\begin{pmatrix}-2\\-4\end{pmatrix}$	2	B1 Translation B1 $\begin{pmatrix}-2\\-4\end{pmatrix}$ NB. Award no marks for a combination of transformations

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
13		For example **UK** **$ per US gal** ($)6.90(841 **£ per litre** [£1.24] **£ per US gal** (£)4.69(96) **$ per litre** ($)1.82(28) Cost in £ per US gal of UK fuel= £1.24 × 3.79 = £4.6996 Cost in $ per US gal of UK fuel = $1.47 × 4.6996 = $6.908412 OR Cost in £ of 1 US gal of US fuel = $3.15 ÷ 1.47 = £2.14 Cost in £ per litre of US fuel = £2.14 ÷ 3.79 =£0. 56(5.. OR Cost in UK in £ per US gal = £1.24 × 3.79 (=£4.6996) Cost in USA in £ per US gal = £3.15 ÷ 1.47 (=2.1428) OR Cost in UK is $ per litre = £1.24 × 1.47 (=1.8228) Cost in USA in $ per litre = 3.15 ÷ 3.79 (=0.8311...)	Cheaper in US	4	M1 for 1.24 × 3.79 (= 4.6996) or 1.24 × 1.47 (=1.8228) M1 for 1.47 × '4.6996' or 3.79 × '1.8228' A1 for 6.90(8412) C1 (dep on M2) for $'6.90(8412)' or $'6.91' and reaching a conclusion consistent with their calculation OR M1 for 3.15 ÷ 1.47 (=2.1428..) or 3.15 ÷ 3.79 (=0.8311) M1 for '2.14' ÷ 3.79 or '0.8311' ÷ 1.47 A1 for 0. 56(53…) C1 (dep on M2) for £'0. 56(53...)' or '£0.57' and reaching a conclusion consistent with their calculation OR M1 1.24 × 3.79 (= 4.6996) M1 3.15 ÷ 1.47 (=2.1428..) A1 4.69(96) and 2.14(28...) C1 (dep on M2) for £'4.69(96)' or £'4.70' AND £'2.14(28...)' and reaching a conclusion consistent with their calculation OR M1 for 1.24 × 1.47 (=1.8228) M1 for 3.15 ÷ 3.79 (=0.8311...) A1 for 1.82(28) and 0.83(11...) C1 (dep on M2) for $'1.82(28)' and $'0.83(11...)' and reaching a conclusion consistent with their calculation NB: Throughout values can be rounded or truncated to 1 or more decimal places. In order to award the communication mark, correct currency must be shown with the calculated value(s) but these can still be rounded or truncated to one or more decimal places as they are being used for comparison.

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
14		$\frac{AC}{\sin 49} = \frac{8.7}{\sin 64}$ $AC = \frac{8.7}{\sin 64} \times \sin 49$ (= 7.305…) $\frac{1}{2}$ × 8.7 × 7.305... × sin (180 – 64 – 49)	29.3	5	M1 for $\frac{AC}{\sin 49} = \frac{8.7}{\sin 64}$ oe M1 for (AC =) $\frac{8.7}{\sin 64} \times \sin 49$ A1 for 7.3(05…) M1 for $\frac{1}{2}$ × 8.7 × '7.305' × sin(180 – 64 – 49) A1 for 29.19 – 29.3 OR M1 for $\frac{BC}{\sin(180-64-49)} = \frac{8.7}{\sin 64}$ oe M1 for (BC =) $\frac{8.7}{\sin 64} \times \sin'67'$ A1 for 8.9(10...) M1 for $\frac{1}{2}$ × 8.7 × '8.910' × sin 49 A1 for 29.19 – 29.3 OR (X is point such that AX is perpendicular to BC) M1 for AX = 8.7×sin 49 (= 6.565…) or XB = 8.7×cos 49 (= 5.707...) M1 for XB = 8.7×cos 49 (= 5.707...) and CX = '6.565' ÷ tan 64 oe (= 3.202…) A1 for 8.9(10...) or 5.7(07...) and 3.2(02...) M1 for ½ × '6.565…' × ('5.707' + '3.202') oe A1 for 29.19 – 29.3

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
15		$\frac{12}{20}\times\frac{11}{19}+\frac{5}{20}\times\frac{4}{19}+\frac{3}{20}\times\frac{2}{19}$ $1-\left(\frac{12}{20}\times\frac{11}{19}+\frac{5}{20}\times\frac{4}{19}+\frac{3}{20}\times\right.$	$\frac{222}{380}$	4	B1 for $\frac{12}{19}$ or $\frac{5}{19}$ or $\frac{3}{19}$ (could be seen in working or on a tree diagram) M1 for $\frac{12}{20}\times\frac{5}{19}$ *or* $\frac{12}{20}\times\frac{3}{19}$ *or* $\frac{5}{20}\times\frac{12}{19}$ *or* $\frac{5}{20}\times\frac{3}{19}$ *or* $\frac{3}{20}\times\frac{12}{19}$ *or* $\frac{3}{20}\times\frac{5}{19}$ M1 for $\frac{12}{20}\times\frac{5}{19}+\frac{12}{20}\times\frac{3}{19}+\frac{5}{20}\times\frac{12}{19}+\frac{5}{20}\times\frac{3}{19}+\frac{3}{20}\times\frac{12}{19}+\frac{3}{20}\times\frac{5}{19}$ A1 for $\frac{222}{380}$ oe or 0.58(421...) OR B1 for $\frac{8}{19}$ or $\frac{15}{19}$ or $\frac{17}{19}$ M1 for $\frac{12}{20}\times\frac{8}{19}$ *or* $\frac{5}{20}\times\frac{15}{19}$ *or* $\frac{3}{20}\times\frac{17}{19}$ M1 for $\frac{12}{20}\times\frac{8}{19}+\frac{5}{20}\times\frac{15}{19}+\frac{3}{20}\times\frac{17}{19}$ A1 for $\frac{222}{380}$ oe or 0.58(421...)

<table>
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<tr><td>16</td><td>(a)</td><td>$\frac{2}{7}\times\frac{1}{6}$

OR

<table><tr><td></td><td>1</td><td>1</td><td>2</td><td>2</td></tr><tr><td>1</td><td>X</td><td>√</td><td></td><td></td></tr><tr><td>1</td><td>√</td><td>X</td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td>X</td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td>X</td></tr><tr><td>2</td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td></tr></table></td><td>$\frac{2}{42}$</td><td>2</td><td>M1 $\frac{2}{7}\times\frac{1}{6}$

A1 $\frac{2}{42}$ oe

OR

M1 Fully correct sample space with the correct cases identified

A1 $\frac{2}{42}$ oe</td></tr>
<tr><td></td><td>(b)</td><td>$\frac{2}{7}\times\frac{5}{6}+\frac{3}{7}\times\frac{2}{6}$

OR

<table><tr><td></td><td>1</td><td>1</td><td>2</td><td>2</td></tr><tr><td>1</td><td>X</td><td></td><td>√</td><td>√</td></tr><tr><td>1</td><td></td><td>X</td><td>√</td><td>√</td></tr><tr><td>2</td><td></td><td></td><td>X</td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td>X</td></tr><tr><td>2</td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td></tr></table></td><td>$\frac{16}{42}$</td><td>3</td><td>M1 for identifying all 3 possibilities of (1,2) and (1,3) and (2,3)
OR
at least one of $\frac{2}{7}\times\frac{3}{6}$ (1, 2) or $\frac{2}{7}\times\frac{2}{6}$ (1, 3) or $\frac{3}{7}\times\frac{2}{6}$ (2, 3) or $\frac{2}{7}\times\frac{5}{6}$ (1, 2 or 3)

M1 $\frac{2}{7}\times\frac{5}{6}+\frac{3}{7}\times\frac{2}{6}$ or $\frac{2}{7}\times\frac{3}{6}+\frac{2}{7}\times\frac{2}{6}+\frac{3}{7}\times\frac{2}{6}$

A1 $\frac{16}{42}$ oe
OR
M2 Fully correct sample space with the correct cases identified

A1 $\frac{16}{42}$ oe</td></tr>
</table>

<table>
<tr><th colspan="5">1MA0 Higher Tier – Practice Paper 2H (Set D)</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>17</td><td></td><td><table><tr><th>Height h m</th><th>Freq</th></tr><tr><td>$0 < h \leq 2$</td><td>7</td></tr><tr><td>$2 < h \leq 4$</td><td>14</td></tr><tr><td>$4 < h \leq 8$</td><td>18</td></tr><tr><td>$8 < h \leq 16$</td><td>24</td></tr><tr><td>$16 < h \leq 20$</td><td>10</td></tr></table></td><td>3</td><td>3</td><td>B3 fully correct histogram with horizontal axis correctly scaled
(B2 for 4 correct blocks or 5 correct blocks with incorrect or no scale)
(B1 for 2 correct blocks of different widths or any 3 correct blocks)
SC : B1 for key, eg. 1 cm2 = 2 (trees) or correct values shown for (freq ÷ class interval) for at least 3 frequencies (3.5, 7, 4.5, 3, 2.5)</td></tr>
<tr><td>18</td><td></td><td>a = 3, b = –4, c = –2

x = $\frac{--4 \pm \sqrt{(-4)^2 - 4 \times 3 \times -2}}{2 \times 3}$
= $\frac{4 \pm \sqrt{16+24}}{6}$ = $\frac{4 \pm \sqrt{40}}{6}$
= 1.72075922
or
= – 0.3874258867</td><td>1.72, –0.387</td><td>3</td><td>M1 for $\frac{--4 \pm \sqrt{(-4)^2 - 4 \times 3 \times -2}}{2 \times 3}$ (condone incorrect signs for –4 and –2)
M1 for $\frac{4 \pm \sqrt{40}}{6}$ or $\frac{2 \pm \sqrt{10}}{3}$
A1 for one answer in the range 1.72 to 1.721
and one answer in the range – 0.387 to – 0.38743</td></tr>
</table>

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
19		LQ = 21 UQ = 45	24	2	M1 for 45 or 21 or 43.5 or 19.5 or 7.75th or 8th or 23.25th or 24th (all of above may be seen in working space or indicated on S&L) or clear attempt to find UQ and LQ from a list of values or in stem and leaf diagram A1 cao
20		$\frac{3(x+1)}{6}+\frac{2(x+3)}{6}$ = $\frac{3x+3+2x+6}{6}$	$\frac{5x+9}{6}$	3	M1 Use of common denominator of 6 (or any other multiple of 6) and at least one numerator correct Eg. $\frac{3(x+1)}{6}$ or $\frac{2(x+3)}{6}$ M1 $\frac{3(x+1)}{6}+\frac{2(x+3)}{6}$ oe A1 cao
21		16 metres: 8 × 108 km. 16: 8 × 108× 1000 16: 8 × 1011 1: 5 × 1010	1: 5 × 1010	3	M1 (indep) correct method to convert to consistent units M1 $\frac{'8\times10^{8}'}{'16'}$ (units may not be consistent) or 5 × 1010 oe or 5 × 107 oe A1 1: 5 × 1010 or 1: 50 000 000 000

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
22		$9 - 3 = 6$ $10^2 - 6^2 = 64$ BC = 8 AC2 = $9^2 + 8^2 = 145$	12.0	5	M2 102 − (9 − 3)2 (=64) or BC = 8 (M1 9 − 3 (= 6) may be seen on diagram) M1 (indep) 92 + 'BC'2 where BC is a numerical value M1 (dep on previous M1) $\sqrt{81+'64'}$ A1 12.0 – 12.042
23	(a)		b – a	1	B1 for b – a or –a + b
	(b)	$\overrightarrow{OP} = \overrightarrow{OA} + \overrightarrow{AP}$ $\overrightarrow{AP} = \frac{3}{4} \times$ (b – a) $\overrightarrow{OP}$ = a + $\frac{3}{4} \times$ (b – a) OR $\overrightarrow{OP} = \overrightarrow{OB} + \overrightarrow{BP}$ $\overrightarrow{BP} = \frac{1}{4} \times$ (a – b) $\overrightarrow{OP}$ = b + $\frac{1}{4} \times$ (a – b)	$\frac{1}{4}$ (a + 3b)	3	B1 for $\frac{3}{4} \times$ '(b – a)' M1 for $(\overrightarrow{OP} =) \overrightarrow{OA} + \overrightarrow{AP}$ or $(\overrightarrow{OP} =) \overrightarrow{OA} + \frac{3}{4}\overrightarrow{AB}$ or a ± $\frac{3}{4} \times$ '(b – a)' A1 for $\frac{1}{4}$ (a + 3b) or $\frac{1}{4}$ a + $\frac{3}{4}$ b OR B1 for $\frac{1}{4} \times$ '(a – b)' M1 for $(\overrightarrow{OP} =) \overrightarrow{OB} + \overrightarrow{BP}$ or $(\overrightarrow{OP} =) \overrightarrow{OB} + \frac{1}{4}\overrightarrow{BA}$ or b ± $\frac{1}{4} \times$ '(a – b)' A1 for $\frac{1}{4}$ (a + 3b) or $\frac{1}{4}$ a + $\frac{3}{4}$ b

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Question		**Working**	**Answer**	**Mark**	**Notes**
24		4n2 + 12n + 32 – (4n2 – 12n + 32) = 4n2 + 12n + 9 – 4n2 + 12n – 9 = 24n =8 × 3n	Proof	3	M1 for 3 out of 4 terms correct in expansion of either (2n + 3)2 or (2n – 3)2 or ((2n + 3) – (2n – 3))((2n + 3) + (2n – 3)) A1 for 24n from correct expansion of both brackets A1 (dep on A1) for 24n is a multiple of 8 or 24n = 8 × 3n or 24n ÷ 8 = 3n
25		$A = \frac{1}{2} \times x \times 2x \times \sin 30^o$ $A = \frac{1}{2} \times 2x^2 \times 0.5$ OR Height = $2x \sin 30^o = x$ $A = \frac{x \times x}{2} = \frac{x^2}{2}$ OR Height = x sin 30 = $\frac{x}{2}$ $A = \frac{1}{2} \times 2x \times \frac{x}{2} = \frac{x^2}{2}$	$x = \sqrt{2A}$ shown	3	M1 $(A =) \frac{1}{2} \times x \times 2x \times \sin 30^o$ A1 $A = x^2 \times 0.5$ or $A = \frac{x^2}{2}$ C1 for completion with all steps shown OR M1 height = 2xsin 30 (= x) A1 $A = x^2 \times 0.5$ or $A = \frac{x^2}{2}$ C1 for completion with all steps shown OR M1 for height = x sin 30 (= $\frac{x}{2}$) A1 $A = x^2 \times 0.5$ or $A = \frac{x^2}{2}$ C1 for completion with all steps shown

1MA0 Higher Tier – Practice Paper 2H (Set D)					
Question		**Working**	**Answer**	**Mark**	**Notes**
26	(a)	Let O be the centre of the base. OB2 + OC2 = 10^2 ; OB2 = 50 AO2 = AB2 – OB2 = 50 Vol = $\frac{1}{3}\times10^2\times\sqrt{50}$	236	4	M1 correct method to start to find BD or BO using triangle OBC or triangle BCD (oe) Eg. OB2 + OC2 = 10^2 or BO 2 = 50 or BO = $\sqrt{50}$ (=7.07..) or BO = $\frac{\sqrt{200}}{2}$ or 102 + 102 = BD2 or BD2 = 200 or BD= $\sqrt{200}$ (=14.1..) M1 (dep) correct method to find height of pyramid using triangle AOB Eg. AO2 = 102 – $'\sqrt{50}'^2$ or AO2 = 50 or AO = $\sqrt{50}$ (=7.07..) M1 (indep) $\frac{1}{3}\times10^2\times'\sqrt{50}'$ (but not $\frac{1}{3}\times10^2\times10$) A1 235 – 236
	(b)	Angle ABO = 45o Angle DAB = 180 – 45 – 45 OR In ΔBAD, cos A = $\frac{10^2+10^2-'\sqrt{200}'^2}{2\times10\times10}$ = 0	90	2	M1 Angle DAB = 180 – 2× '45' A1 89.98 - 90 OR M1 cos BAD = $\frac{10^2+10^2-'\sqrt{200}'^2}{2\times10\times10}$ A1 89.98 - 90

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Question		**Working**	**Answer**	**Mark**	**Notes**
27	(a)	$x = \dfrac{-9 \pm \sqrt{9^2 - 4\times 2\times -7}}{2\times 2}$ $= \dfrac{-9 \pm \sqrt{137}}{4}$	0.676, − 5.18	3	$\dfrac{-9 \pm \sqrt{9^2 - 4\times 2\times -7}}{2\times 2}$ M1 allow substitution of ±7 for c $\dfrac{-9 \pm \sqrt{137}}{4}$ M1 A1 answers in ranges 0.67 - 0.68 and − 5.17 to − 5.18 OR M1 $(x + \frac{9}{4})2$ oe M1 for method leading to $\pm\sqrt{\frac{137}{16}} - \frac{9}{4}$ A1 answers in ranges 0.67 - 0.68 and − 5.17 to − 5.18
	(b)	Put $y = \dfrac{1}{x}$ and use part (a) Or $7y^2 - 9y - 2 = 0$ $y = \dfrac{--9 \pm \sqrt{(-9)^2 - 4\times 7\times}}{2\times 7}$ $\dfrac{9 \pm \sqrt{137}}{14}$	1.48, − 0.193	2	$y = \dfrac{1}{x}$ or $x = \dfrac{1}{y}$ M1 A1 (ft) answers in range 1.47 - 1.48 and − 0.19 to − 0.194 OR M1 fully correct method which leads to 7y2 − 9y − 2= 0 or −7y2 + 9y + 2 = 0 with correct method to solve (condone sign errors in substitution) A1 (ft) answers in range 1.47 - 1.48 and − 0.19 to − 0.194

New Qn	Question Number	Paper Date	Skill tested	Maximum score	Mean Score	Mean Percentage	Percentage scoring full marks
1a	Q14b	2H 1206	Solve linear equations in one unknown, with integer or fractional coefficients	3	1.05	35	28.4
1b	Q14c	2H 1206	Factorise quadratic expressions using the difference of two squares	1	0.47	47	46.6
1c	Q14d	2H 1206	Use instances of index laws, including use of fractional, zero and negative powers, and powers raised to a power	2	0.45	23	12.2
2	Q16	2H 1206	Use the trigonometric ratios to solve 2-D and 3-D problems	3	1.21	40	35.4
3	Q05	2H 1211	Understand and use compound measures, including speed and density	3	1.17	39	24.3
4a	Q11a	2H 1211	Calculate volumes of right prisms and shapes made from cubes and cuboids	2	0.32	16	7.2
4b	Q11b	2H 1211	Use systematic trial and improvement to find approximate solutions of equations where there is no simple analytical method of solving them	4	1.52	38	5.4
5a	Q14b	2H 1211	Factorise quadratic expressions	2	0.76	38	29.3
5b	Q14c	2H 1211	Factorise quadratic expressions	3	0.30	10	0.5
6	Q17	2H 1211	Use the trigonometric ratios to solve 2-D and 3-D problems	3	1.09	36	34.6
7	Q18	2H 1206	Understand, recall and use Pythagoras' theorem in 2-D, then in 3-D problems	5	1.67	33	41.5
8	Q16	2H 1211	Use percentages in real life situations	3	1.00	33	16.2
9	Q08c	2H 1211	Solve simple linear inequalities in one variable, and represent the solution set on a number line	2	0.64	32	20.5
10a	Q23a	2H 1206	Understand sample and population	2	0.50	25	6.5
10b	Q23b	2H 1206	Understand sample and population	2	0.61	31	27.3
11	Q13	2H 1211	Understand and use compound measures, including speed and density	3	0.93	31	24.4
12	Q02b	2H 1211	Describe and transform 2-D shapes using single translations	2	0.57	28	13.6
13	Q10	2H 1211	Calculate an unknown quantity from quantities that vary in direct or inverse proportion	4	1.01	25	13.2
14	Q24	2H 1206	Use the sine and cosine rules to solve 2-D and 3-D problems	5	1.19	24	17.0
15	Q25	2H 1206	Understand selection with or without replacement	4	0.96	24	15.4
16a	Q21a	2H 1211	Understand conditional probabilities	2	0.39	20	6.9
16b	Q21b	2H 1211	Understand conditional probabilities	3	0.31	10	
17	Q24	2H 1211	Produce histograms from class intervals with unequal width	3	0.54	18	14.1
18	Q22	2H 1206	Solve simple quadratic equations by using the quadratic formula	3	0.51	17	9.2

19	Q09b	2H 1211	Calculate median, mean, range, quartiles and interquartile range, mode and modal class - (SP.h)	2	0.31	16	10.9
20	Q20	2H 1211	Simplify rational expressions by cancelling, adding, subtracting, and multiplying	3	0.49	16	12.9
21	Q19	2H 1211	Write ratios in their simplest form	3	0.44	15	3.5
22	Q15	2H 1211	Understand, recall and use Pythagoras theorem in 2-D, then in 3-D problems	5	0.64	13	8.8
23a	Q26a	2H 1206	Calculate the resultant of two vectors	1	0.37	37	36.8
23b	Q26b	2H 1206	Solve geometrical problems in 2-D using vector methods	3	0.36	12	7.8
24	Q21	2H 1206	Use algebraic manipulation to solve problems	3	0.29	10	5.2
25	Q25	2H 1211	Calculate the area of a triangle given the length of two sides and the included angle	3	0.14	5	2.5
26a	Q23a	2H 1211	Find the surface area and volumes of compound solids constructed from cubes, cuboids, cones, pyramids, spheres, hemispheres, cylinders	4	0.11	3	0.6
26b	Q23b	2H 1211	Solve problems involving more complex shapes and solids, including segments of circles and frustums of cones	2	0.19	10	
27a	Q22a	2H 1211	Solve simple quadratic equations by using the quadratic formula	3	0.44	15	0.9
27a	Q22b	2H 1211	Solve simple quadratic equations by using the quadratic formula	2	0.03	2	
				100	**22.98**	**23**	