1380/4Higher Calculator					
Question		Working	Answer	Mark	Notes
1	(a)	325×1.68	546	2	M1 for 325×1.68 seen or digits 546 A1 for 546, accept 546.00, 546.0
	(b)	$117 \div 1.5$	78	2	M1 for $117 \div 1.5$ seen or digits 78 A1 for 78, accept 78.00, 78.0
2	(a)		Correct shape	2	B2 for correct shape; any orientation. (B1 for any two sides correct or all correct for scale factor other than 1 or 2), tolerance to within half square
	(b)		Reflection in line $x = 0$	2	B1 for reflection, reflect, reflected. B1 for line $x = 0$ or y-axis NB: more than one transformation should be awarded 0 marks.
3		1^2+1 2^2+1 3^2+1	2, 5, 10	2	M1 for 1^2+1 or 2^2+1 or 3^2+1 (but not 1^2+1, 2^2+2, 3^2+3) A1 for 2, 5, 10 SC: B1 for 1, 2, 5 with or without working
4	(a)		(65, 100), (80, 110) plotted	1	B1 for plotting both points (65, 100), (80, 110) correctly (tolerance one square); ignore any additional plots given.
	(b)		positive (correlation)	1	B1 for positive (correlation) or length increases with height oe
	(c)		105 - 110	2	M1 for a single line segment with positive gradient that could be used as a line of best fit or a vertical line from 76 A1 for given answer in the range 105 – 110

1380/4H					
Question		**Working**	**Answer**	**Mark**	**Notes**
5		143.64 ÷ 19 = 7.56 7.56 × 31 =	234.36	3	M1 for 143.64 ÷ 19 (or 7.56 seen) or 143.64 × 31 (or 4452.84 seen) M1(dep) for '7.56' × 31 or '4452.84' ÷ 19 or 143.64 + 12×'7.56' A1 for 234.36 cao accept 234.36p **Alternative method:** M1 for $\frac{31}{19}$ (or 1.63(1…) seen) M1 (dep) '1.63…' × 143.64 A1 for 234.36 cao accept 234.36p
6	(a)	1.8 × –8 + 32	17.6	2	M1 for 1.8 × -8 or -14.4 or $\frac{-72}{5}$ seen or 32 – '1.8 × 8' or 1.8 × –8 + 32 seen A1 for 17.6 or $\frac{88}{5}$ or 17.60 oe
	(b)	68 = 1.8C + 32 1.8C = 68 – 32 C = 36 ÷1.8	20	2	M1 for 68 – 32 or 36 or 68 = 1.8C + 32 seen; condone replacement of C by another letter. A1 for 20 cao NB Trial and improvement score 0 or 2
7			diagram	3	M1 for line drawn or point marked within guidelines from *P* M1 for line drawn or point marked within guidelines from *Q* up to top guideline from *P* A1 for point indicated within region where guidelines intersect

<table>
<tr><th colspan="6">1380/4H</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>8</td><td>(a)</td><td>$18 \div 6 : 12 \div 6$</td><td>3 : 2</td><td>2</td><td>M1 for 18 : 12 or 12 : 18 or 1.5:1 oe or any correct ratio reversed eg 2:3
A1 for 3 : 2 or 1 : 0.6 … [recurring]</td></tr>
<tr><td></td><td>(b)</td><td>5 + 1 = 6
$54 \div 6 = 9$
5 × 9</td><td>45</td><td>2</td><td>M1 for $\frac{5}{5+1} \times 54$ or $\frac{1}{5+1} \times 54$ or 54 ÷ ‘5+1’ or 54 × 5
or 270 or 9 : 45
or 9 seen, as long as it is not associated with incorrect working.
A1 for 45 cao</td></tr>
<tr><td>9</td><td></td><td><table><tr><td>2</td><td>48</td></tr><tr><td>3</td><td>87</td></tr><tr><td>2.5</td><td>65.(625)</td></tr><tr><td>2.6</td><td>69.(576)</td></tr><tr><td>2.7</td><td>73.(683)</td></tr><tr><td>2.65</td><td>71.6(09)</td></tr><tr><td>2.61</td><td>69.9(79)</td></tr><tr><td>2.62</td><td>70.3(84)</td></tr><tr><td>2.63</td><td>70.7(91)</td></tr><tr><td>2.64</td><td>71.1(99)</td></tr><tr><td>2.66</td><td>72.(021)</td></tr><tr><td>2.67</td><td>72.4(34)</td></tr><tr><td>2.68</td><td>72.8(48)</td></tr><tr><td>2.69</td><td>73.2(65)</td></tr></table></td><td>2.6</td><td>4</td><td>B2 for trial $2.6 \leq x \leq 2.7$ evaluated
(B1 for trial $2 \leq x \leq 3$ evaluated)

B1 for different trial $2.6 < x \leq 2.65$

B1(dep on at least one previous B1) for 2.6

Values evaluated can be rounded or truncated, but to at least 2sf when x has 1dp and 3sf when x has 2dp

NB Allow 72 for evaluation using $x = 2.66$

NB No working scores no marks even if answer is correct</td></tr>
<tr><td>10</td><td></td><td></td><td>construction</td><td>2</td><td>M1 for arcs from same centre on 2 lines at same distance from meeting point
($\pm$ 2mm)
A1 for bisector ($\pm$ 2°) and correct arcs
SC: B1 for bisector ($\pm 2°$) with no arcs, or incorrect arcs if M0 awarded.
Accept bisectors that are dashed or dotted.</td></tr>
</table>

1380/4H					
Question		Working	Answer	Mark	Notes
11			2 + 'prime number' is odd	2	M1 for a counter example showing intent to add 2 and another prime number; ignore incorrect examples A1 for a correctly evaluated counter example with no examples given that involve either non-primes or incorrect evaluation **Alternative method** B2 for fully correct explanation '2 is a prime number, odd + even (or 2) = odd' oe with no accompanying incorrect statements or examples (B1 for '2 is a prime number' **or** recognition that not all prime numbers are odd **or** odd + even (or 2) = odd; ignore incorrect examples or statements)
12		15 × 3 = 45 15 × 3.5 25 × 9 = 225 25 × 9.5 20 × 15 = 300 20 × 15.5 12 × 21 = 252 12 × 21.5 8 × 27 = 216 8 × 27.5 1038 ÷ 80 = 12.975 1078 ÷ 80 = 13.475	12.97 – 13.48	4	M1 for fx consistently within interval including ends (allow 1 error) M1 (dep) consistently using appropriate midpoints M1 (dep on first M) for $\Sigma fx \div \Sigma f$ A1 for 12.97 – 13.48 with no arithmetic errors

1380/4H					
Question		**Working**	**Answer**	**Mark**	**Notes**
13		(0.5 × 3.14... × 8) + 8	20.56 – 20.58	3	M2 for (0.5 × π × 8) or π × 4 or (π × 8 + 8) or (0.5 x π × 8 + 8) oe (M1 for π × 8 or 2π × 4; for a value 25.1-25.2 inclusive unless seen with incorrect working eg πr^2) A1 for 20.56 – 20.58 (**SC**: B2 if M0 scored for 12.56 – 12.58)
14	(a)		a^3	1	B1 for a^3 cao
	(b)	5 × 3*x* – 5 × 2	15*x* – 10	1	B1 for 15*x* – 10 cao
	(c)	$3y \times y + 3y \times 4$	$3y^2$ +12*y*	2	M1 for $3y \times y + 3y \times 4$ or $3y^2$ + *a* or $3y^2$+a*y* or *b* + 12*y* or by^2+12*y* where *a* ,*b* are integers, and can be zero A1 for $3y^2$ +12*y* or $3 \times y^2 + 12 \times y$ NB: If more than 2 terms in expansion MOA0
	(d)	$2x - 8 + 3x + 6$	$5x - 2$	2	M1 for $2 \times x - 2 \times 4$ or $2x - 8$ or $3 \times x + 3 \times 2$ or $3x + 6$ A1 for $5x - 2$ cao
	(e)	$x^2 + 4x - 3x - 12$	$x^2 + x - 12$	2	M1 for 4 terms correct with or without signs, or 3 out of no more than 4 terms, with correct signs (the terms may be in an expression or table) or $x(x-3)+4(x-3)$ or $x(x+4)-3(x+4)$ A1 for $x^2 + x - 12$ cao
15		4.6 + 3.85 = 8.45 3.2^2 – 6.51 = 3.73 8.45 ÷ 3.73 =	2.26541555	2	M1 for $\frac{169}{20}$ or $\frac{256}{25}$ or $\frac{373}{100}$ or 3.73 or 10.24 or 8.45 seen A1 for 2.265(41555); accept $\frac{845}{373}$

1380/4H					
Question		**Working**	**Answer**	**Mark**	**Notes**
16	(a)	t^{6+2}	t^8	1	B1 for t^8 or for t^{6+2}
	(b)	m^{8-3}	m^5	1	B1 for m^5 or for m^{8-3}
	(c)	$2^3 \times x^3$	$8x^3$	2	B2 for $8x^3$ cao (B1 for ax^3, $a \neq 8$ or $2x \times 2x \times 2x$ or $8x^n$ $n \neq 0,3$)
	(d)	$3 \times 4 \times a^{2+5} \times h^{1+4}$	$12a^7h^5$	2	B2 for $12a^7h^5$ (B1 for $12a^7h^n$, $n \neq 0,5$ or $12a^mh^5$, $m \neq 0,7$ or ka^7h^5, $k \neq 12$ or $3 \times 4 \times a^{2+5} \times h^{1+4}$)
17		$9^2 - 6^2$ $81 - 36 = 45$ $\sqrt{45}$	6.705 - 6.71	3	M1 for $9^2 - 6^2$ or 81 – 36 or 45 or $9^2 = AB^2 + 6^2$ oe M1 for $\sqrt{81-36}$ or $\sqrt{45}$ A1 for 6.705 – 6.71 [**SC:** M1 for $\sqrt{81+36}$ or $\sqrt{117}$]
18	(a)		Heaviest bag is 29kg	1	B1 for 23kg is the upper quartile oe, or the heaviest bag is 29kg oe, or 25% of bags are heavier than 23kg or range is 5 – 29 oe
	(b)		17	1	B1 for 17 cao
	(c)	23 – 10	13	1	B1 for 13 cao
	(d)	$\frac{25}{100} \times 240$	60	2	M1 for $\frac{25}{100} \times 240$ oe or $\frac{25}{100} \times 241$ oe A1 for 60 cao (**SC:** B1 for 25% or 0.25 or quarter seen)

1380/4H					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)	4500×1.04^2	4867.20	3	M1 for 4500 × 1.04 or for 4500 + 0.04 × 4500 or for 4680 or 180 or 360 or 4860 M1 (dep) '4680' × 1.04 or for '4680' + 0.04 × '4680' A1 for 4867.2(0) cao (If correct answer seen then ignore any extra years) **Alternative method** M2 for 4500×1.04^2 or 4500 × 1.04^3 A1 for 4867.2(0) cao [SC: 367.2(0) seen B2]
	(b)	2400×1.075^n 2580 2773.5 2981.5125 3205.12... 3445.51...	5	2	M1 for an attempt to evaluate 2400×1.075^n for at least one value of n (not equal to 1) or 3445.51 ÷ 1.075^n ($n \geq 2$) or $\frac{3445.51}{2400}$ (=1.4356...) and 1.075^n evaluated, $n \geq 2$ A1 for 5 cao

1380/4H					
Question		**Working**	**Answer**	**Mark**	**Notes**
20	(a)	$\cos x = \frac{5}{8}$	51.3 - 51.35	3	M1 for $\cos(x=)\frac{5}{8}$ M1 for $\cos^{-1}\frac{5}{8}$ or $\cos^{-1}0.625$, or $\cos^{-1}(5\div 8)$ A1 for 51.3 - 51.35 (SC B2 for 0.89 – 0.9 or 57 - 57.1 seen) **Alternative Scheme** $h^2 = 8^2 - 5^2$ (=39) M1 for $\sin(x=)\ \frac{\sqrt{"39"}}{8}$ or $\tan(x=)\frac{\sqrt{"39"}}{5}$ or $\frac{\sin x}{\sqrt{"39"}} = \frac{\sin 90}{8}$ oe or $(\sqrt{"39"})^2 = 8^2 + 5^2 - 2\times 8\times 5\times\cos x$ M1 for $\sin^{-1}(\frac{\sqrt{"39"}}{8})$ or $\sin^{-1}(\frac{\sqrt{"39"}\times\sin 90}{8})$ or $\tan^{-1}(\frac{\sqrt{"39"}}{5})$ or $\cos^{-1}(\frac{8^2+5^2-(\sqrt{"39"})^2}{2\times 8\times 5})$ A1 for 51.3 - 51.35

1380/4H					
Question		**Working**	**Answer**	**Mark**	**Notes**
	(b)	$\tan 40 = \frac{y}{12.5}$ $y = 12.5 \times \tan 40$	10.4 - 10.5	3	M1 for $\tan 40 = \frac{y}{12.5}$ M1 for $12.5 \times \tan 40$ A1 for 10.4 – 10.5 SC: B2 for ±(13.9 – 14.0) or 9 - 9.1 seen **Alternative scheme** M1 for $\frac{y}{\sin 40} = \frac{12.5}{\sin 50}$ oe M1 for $y = \frac{12.5}{\sin 50} \times \sin 40$ A1 for 10.4 – 10.5 SC: B2 for ±(35.4 - 35.5) or 10.39 - 10.396 seen
21	(a)	$\frac{26}{258} \times 50$	5	2	M1 for $\frac{a}{258} \times 50$ or $50 \div \frac{258}{a}$ oe, a < 258 or 5.03(8...) or 26 ÷ 5.16 A1 for 5 cao
	(b)	$\frac{(25+48+62)}{258} \times 50$	26	2	M1 for $\frac{135}{258} \times 50$ or $\frac{(25+48+62)}{258} \times 50$ or $\left(\frac{25}{258} \times 50 + \frac{48}{258} \times 50 + \frac{62}{258} \times 50\right)$ oe or 26.1(6...) or 5 + 9 + 12 or $135 \div 5.16$ A1 for 26 or 27

1380/4H					
Question		**Working**	**Answer**	**Mark**	**Notes**
22		$(9n^2+6n+1)-$ $(9n^2-6n+1)$ $=12n$	$12n$ correct comment	3	M1 for $(3n)^2+3n+3n+1$ or $(3n)^2-3n-3n+1$ or $((3n+1)-(3n-1))((3n+1)+(3n-1))$ A1 for $12n$ from correct expansion of both brackets A1 for $12n$ is a multiple of 4 or $12n = 3\times 4n$ or $12n = 4\times 3n$ or $\frac{12n}{4}=3n$ or $\frac{12n}{3}=4n$ NB: Trials using different values for n score no marks.
23	(a)		**b** – **a**	1	B1 for **b** – **a** or – **a** + **b** oe
	(b)	$\overrightarrow{OP}=\overrightarrow{OA}+\overrightarrow{AP}$ $\overrightarrow{OP} = a + \frac{3}{5}$(**b** – **a**) $\overrightarrow{OP} = \frac{1}{5}$(2**a** + 3**b**)	proof	3	M1 for $\overrightarrow{OP}=\overrightarrow{OA}+\overrightarrow{AP}$ oe or $\overrightarrow{OP}=\overrightarrow{OB}+\overrightarrow{BP}$ oe M1 for $\overrightarrow{AP}=\frac{3}{5}$ x **"(b - a)"** oe or $\overrightarrow{BP}=\frac{2}{5}$ x **"(a - b)"** oe A1 for **a** + $\frac{3}{5}$ x (**b** - **a**) oe or **b** + $\frac{2}{5}$ x (**a** - **b**) oe leading to given answer with correct expansion of brackets seen

1380/4H					
Question		Working	Answer	Mark	Notes
24		$\frac{1}{2}\times 6\times 6\times \sin 60$ $-\frac{60}{360}\times \pi \times 3^2$ = 15.588 – 4.712	10.8 - 10.9	4	M1 for $\frac{1}{2}\times 6\times 6\times \sin 60$ or for $0.5\times 6\times \sqrt{6^2-3^2}$ or 15.5 – 15.6 or 14.5 – 14.6 or ±5.48(65…) M1 for $\frac{60}{360}\times \pi \times 3^2$ (= 4.712…) M1(dep on 1 previous M1) for 'area of triangle' – 'area of sector' A1 for 10.8 – 10.9 SC: B3 for 10.1 – 10.2 or 9.84 – 9.85
25		$\frac{(x-3)\cancel{(x-5)}}{(2x+3)\cancel{(x-5)}}$	$\frac{(x-3)}{(2x+3)}$	3	B1 for $(x-3)(x-5)$ or $x(x-5)-3(x-5)$ M1 for $(2x\pm 3)(x\pm 5)$ or $2x(x+5)\pm 3(x+5)$ or $2x(x-5)\pm 3(x-5)$ A1 for $\frac{(x-3)}{(2x+3)}$ cao as final answer

1380/4H					
Question		**Working**	**Answer**	**Mark**	**Notes**
26		$\frac{5}{20}\times\frac{7}{19}+\frac{5}{20}\times\frac{8}{19}+\frac{7}{20}\times\frac{5}{19}+\frac{7}{20}\times\frac{8}{20}+\frac{8}{20}\times\frac{5}{19}+\frac{8}{20}\times\frac{7}{19}$ **or** $\left(\frac{5}{20}\times\frac{15}{19}+\frac{7}{20}\times\frac{13}{19}+\frac{8}{20}\times\frac{12}{19}\right)$ **or** 1 – $\left(\frac{5}{20}\times\frac{4}{19}+\frac{7}{20}\times\frac{6}{19}+\frac{8}{20}\times\frac{7}{19}\right)$	$\frac{131}{190}$	4	M1 for at least one product of the form $\frac{a}{20}\times\frac{b}{19}$ M1 for identifying all products (condone 2 errors in 6 products, 1 error in 3 products) **Either** $\left(\frac{5}{20}\times\frac{7}{19},\frac{5}{20}\times\frac{8}{19},\frac{7}{20}\times\frac{5}{19},\frac{7}{20}\times\frac{8}{19},\frac{8}{20}\times\frac{5}{19},\frac{8}{20}\times\frac{7}{19}\right)$ **or** $\left(\frac{5}{20}\times\frac{15}{19}\text{ , }\frac{7}{20}\times\frac{13}{19}\text{ , }\frac{8}{20}\times\frac{12}{19}\right)$**or** $\left(\frac{5}{20}\times\frac{4}{19}\text{ , }\frac{7}{20}\times\frac{6}{19}\text{ , }\frac{8}{20}\times\frac{7}{19}\right)$ M1 (dep) for $\left(\text{'},\frac{5}{20}\times\frac{7}{19}+\frac{5}{20}\times\frac{8}{19}+\frac{7}{20}\times\frac{5}{19}+\frac{7}{20}\times\frac{8}{19}+\frac{8}{20}\times\frac{5}{19}+\frac{8}{20}\times\frac{7}{19}\text{'}\right)$ oe **or** $\left(\text{'}\frac{5}{20}\times\frac{15}{19}+\frac{7}{20}\times\frac{13}{19}+\frac{8}{20}\times\frac{12}{19}\text{'}\right)$ oe **or** 1 – $\left(\text{'}\frac{5}{20}\times\frac{4}{19}+\frac{7}{20}\times\frac{6}{19}+\frac{8}{20}\times\frac{7}{19}\text{'}\right)$oe A1 for $\frac{131}{190}$ oe or 0.68947… correct to at least 2 decimal places or answer that rounds to 0.69 **NB : If decimals used for products then must be correct to at least 2 decimal places**

					With replacement M0 M1 for identifying all products (condone 2 errors in 6 products, 1 error in 3 products) **either** $\left(\frac{5}{20}\times\frac{7}{20},\frac{5}{20}\times\frac{8}{20},\frac{7}{20}\times\frac{5}{20},\frac{7}{20}\times\frac{8}{20},\frac{8}{20}\times\frac{5}{20},\frac{8}{20}\times\frac{7}{20}\right)$ **or** $\left(\frac{5}{20}\times\frac{5}{20},\frac{7}{20}\times\frac{7}{20},\frac{8}{20}\times\frac{8}{20}\right)$ **or** $\left(\frac{5}{20}\times\frac{15}{20},\frac{7}{20}\times\frac{13}{20},\frac{8}{20}\times\frac{12}{20}\right)$ M1 (dep) for $\left(,\frac{5}{20}\times\frac{7}{20}+\frac{5}{20}\times\frac{8}{20}+\frac{7}{20}\times\frac{5}{20}+\frac{7}{20}\times\frac{8}{20}+\frac{8}{20}\times\frac{5}{20}+\frac{8}{20}\times\frac{7}{20},\right)$ **or** $\left(,\frac{5}{20}\times\frac{15}{20}+\frac{7}{20}\times\frac{13}{20}+\frac{8}{20}\times\frac{12}{20},\right)$ **or** $1-\left(,\frac{5}{20}\times\frac{5}{20}+\frac{7}{20}\times\frac{7}{20}+\frac{8}{20}\times\frac{8}{20},\right)$ A0 for $\frac{262}{400}$ oe or 0.655 (NB: $\frac{262}{400}$ oe or 0.655 implies M2) **Partial replacement** SC: B2 for $\frac{141}{200}$ oe or 0.705 **or** $\frac{121}{190}$ oe or 0.6368… correct to at least 2 decimal places