



The 100% Club – Homework Pack (H)



Know your basics!

Name: _____

To achieve highly in the Higher tier paper it is essential that you achieve 100% at the beginning of the paper and with key fluency questions.





This homework is **in addition** to your independent revision on Hegarty Maths.

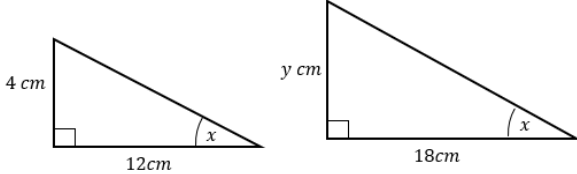
“Exam Q #” Column Explained

“1”: Each question in the 100% booklet relates directly to a key question from your pre-seen mock exams. The question number can be found in the first column.

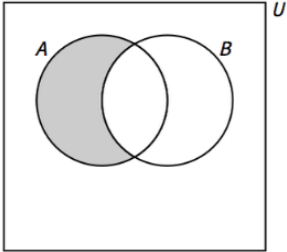
“Extra”: an extra question that wasn’t in the exam but links to an exam question

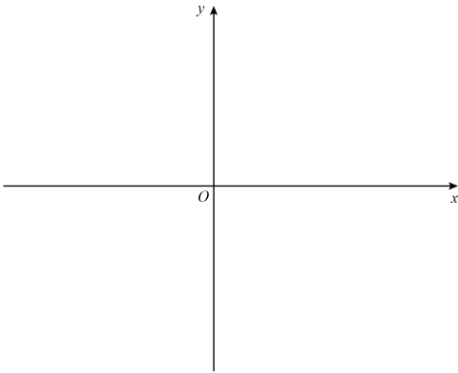
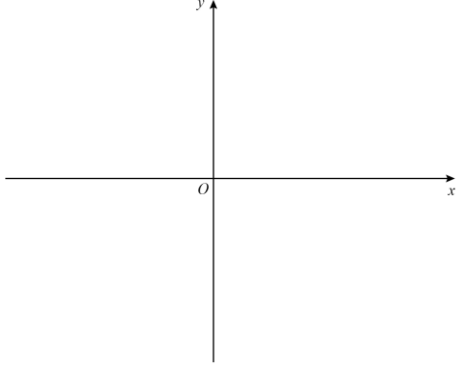
Each question is worth 1 mark. Track your progress below.

Session	Time Taken	Score	Percentage	Date Due
1 		/10		06/03/20
2		/10		
3		/10		13/03/20
4 		/10		
5		/10		20/03/20
6		/10		
7 		/10		27/03/20
8		/10		
9		/10		03/04/20
10 		/10		

Exam Q #	Homework 1 – Paper 1 (Non Calculator)
1	 <p style="text-align: center;">10cm 12cm 6cm 8cm</p>
2	<p>Work out the value of $\left(1\frac{1}{3}\right)^2$</p> <p style="text-align: center;">$1\frac{1}{9}$ $1\frac{7}{9}$ $2\frac{4}{9}$ $2\frac{2}{6}$</p>
3	<p>Work out the arc length, in metres, of a semicircle of radius 5 metres.</p> <p style="text-align: center;">2.5π 5π 10π 25π</p>
4	<p>Circle the fraction that is equivalent to 3.125</p> <p style="text-align: center;">$\frac{13}{4}$ $\frac{25}{8}$ $\frac{125}{3}$ $\frac{28}{8}$</p>
5a	<p>Write 0.00507 in standard form.</p>
5b	<p>Work out</p> $\frac{1 \times 10^6}{4 \times 10^3}$ <p>Give your answer as an ordinary number</p>

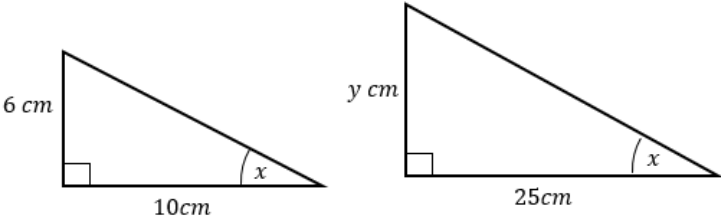
7	<p>Four friends arrive at a party. Their arrival increases the number of people at the party by 25% In total, how many people are now at the party?</p>
8	<p>Work out the value of $(3^{10} \div 3^6) \div (3^2 \times 3)$</p>
12	<p>The next term of a sequence is made by adding the previous two terms. Which of these sequences follows this rule?</p> <p style="text-align: center;"> $0, -4, -4, -8, -5$ $-2, 5, -3, 2, -1$ $-8, 3, -5, -2, -7$ $-1, -1, -2, -3, 1$ </p>
16	<p>Simplify fully</p> $\frac{6x - 15x^2}{10x - 4}$

Exam Q #	Homework 2 – Paper 2 (Calculator)
1	<p>Circle the point that lies on the curve $y = x^2 - 6x + 2$</p> <p style="text-align: center;">(-1,-5) (-1, -9) (-1, -7) (-1, 9)</p>
2	<p>The height of a tree is 15 metres, correct to the nearest metre. Circle the error interval.</p> <p style="text-align: center;"> $14.5 \text{ m} \leq \text{height} < 15.5 \text{ m}$ $14.5 \text{ m} \leq \text{height} \leq 15.5 \text{ m}$ $14.5 \text{ m} < \text{height} \leq 15.5 \text{ m}$ $14.5 \text{ m} < \text{height} < 15.5 \text{ m}$ </p>
3	<p>$2a$ is three times bigger than b.</p> <p>Circle the ratio $a : b$</p> <p style="text-align: center;">3 : 2 6 : 1 2 : 3 2 : 5</p>
4	<div style="text-align: center;">  </div> <p>Which of these represents the shaded region? Circle your answer.</p> <p style="text-align: center;"> $A \cap B$ $(A \cap B)'$ $A \cap B'$ $A' \cup B$ </p>

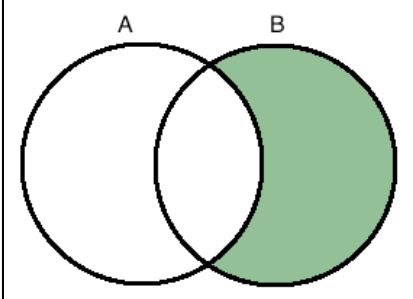
8	<p>On the axes, sketch the curve $y = x^3 + 2$</p> <p>You must show the coordinates of y-intercept.</p> 	<p>On the axes, sketch the curve $y = x^2 - 1$</p> <p>You must show the coordinate of the y-intercept</p> <p>Extra</p> 												
9a	<p>Circle the two words that describe the data</p> <p>Continuous Discrete</p> <p>Grouped Ungrouped</p>	<table border="1" data-bbox="794 1133 1390 1402"> <thead> <tr> <th>Injury time, t (minutes)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>$0 < t \leq 2$</td> <td>23</td> </tr> <tr> <td>$2 < t \leq 4$</td> <td>18</td> </tr> <tr> <td>$4 < t \leq 6$</td> <td>17</td> </tr> <tr> <td>$6 < t \leq 8$</td> <td>30</td> </tr> <tr> <td>$8 < t \leq 10$</td> <td>22</td> </tr> </tbody> </table>	Injury time, t (minutes)	Frequency	$0 < t \leq 2$	23	$2 < t \leq 4$	18	$4 < t \leq 6$	17	$6 < t \leq 8$	30	$8 < t \leq 10$	22
Injury time, t (minutes)	Frequency													
$0 < t \leq 2$	23													
$2 < t \leq 4$	18													
$4 < t \leq 6$	17													
$6 < t \leq 8$	30													
$8 < t \leq 10$	22													
9b	<p>Which class interval contains the median</p>													
extra	<p>Which is the modal class?</p>													
10	<p>x is an integer.</p> <p style="text-align: center;">$-4 < 2x \leq 2$ and $2 \leq x + 4 < 7$</p> <p>Work out all the possible values of x.</p>													

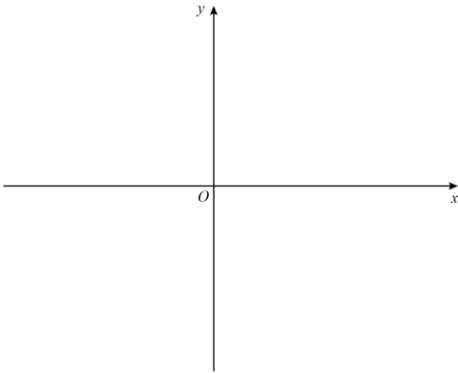
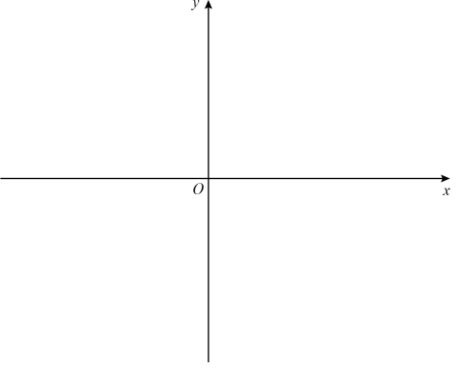
Exam Q #	Homework 3 – Paper 3 (Calculator)
1	<p>Work out £1.20 as a fraction of 30p</p> <p style="text-align: center;"> $\frac{1}{12}$ $\frac{1}{4}$ $\frac{4}{1}$ $\frac{3}{10}$ </p>
2	<p>For a biased dice, $P(6) = \frac{4}{5}$</p> <p>Circle the probability of two sixes when the dice is rolled twice.</p> <p style="text-align: center;"> $\frac{8}{5}$ $\frac{8}{10}$ $\frac{16}{25}$ $\frac{8}{25}$ </p>
3	<p>Circle the lowest common multiple (LCM) of 4, 8 and 20</p> <p style="text-align: center;">4 80 40 20</p>
Extra	<p>Circle the highest common factor (HCF) of 8, 10, 16</p> <p style="text-align: center;">1 2 4 16</p>
4	<p>Circle the two roots of $(x - 4)(x + 1) = 0$</p> <p style="text-align: center;">-4 -1 1 4</p>
Extra	<p>Circle the turning point of $(x - 5)^2 - 3 = 0$</p> <p style="text-align: center;">(-5, -3) (5, 3) (5, -3) (-5, 3)</p>

6	<p>To the nearest pound, Jon has £7 To the nearest 50p, Ellie has £5.50 Work out the maximum possible total amount of money.</p>												
7	<p>Two solids, J and K, have the same density. Complete the table. Include units in your answers.</p> <table border="1" data-bbox="489 822 1197 1016" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>J</th> <th>K</th> </tr> </thead> <tbody> <tr> <td>Mass</td> <td>35g</td> <td>70g</td> </tr> <tr> <td>Volume</td> <td>7 cm³</td> <td></td> </tr> <tr> <td>Density</td> <td></td> <td></td> </tr> </tbody> </table>		J	K	Mass	35g	70g	Volume	7 cm ³		Density		
	J	K											
Mass	35g	70g											
Volume	7 cm ³												
Density													
Extra	<p>Rearrange $y = \frac{x-2}{3}$ to make x the subject.</p> <p style="text-align: center;">$x = y + 5$ $x = 3y - 2$ $x = 3y + 2$ $x = y + 2$</p>												
8	<p>Rearrange $y = 9x + 4$ to make x the subject.</p> <p style="text-align: center;">$x = \frac{y}{4} - 9$ $x = \frac{y-4}{9}$ $x = \frac{y+2}{9}$ $x = \frac{y}{4} + 9$</p>												

Exam Q #	Homework 4 – Paper 1 (Non Calculator)
1	 <p style="text-align: center;">9cm 12cm 15cm 21cm</p>
2	<p>Work out the value of $\left(1\frac{1}{2}\right)^3$</p> <p style="text-align: center;">$3\frac{3}{8}$ $1\frac{3}{6}$ $1\frac{1}{8}$ $3\frac{1}{8}$</p>
3	<p>Work out the arc length, in metres, of a semicircle of radius 11 metres.</p> <p style="text-align: center;">5π 5.5π 11π 22π</p>
4	<p>Circle the fraction that is equivalent to $2.\dot{6}$</p> <p style="text-align: center;">$\frac{8}{3}$ $\frac{2}{6}$ $\frac{4}{3}$ $\frac{6}{3}$</p>
5a	<p>Write 5 070 000 in standard form.</p>
5b	<p>Work out</p> $\frac{3 \times 10^9}{8 \times 10^5}$ <p>Give your answer as an ordinary number</p>

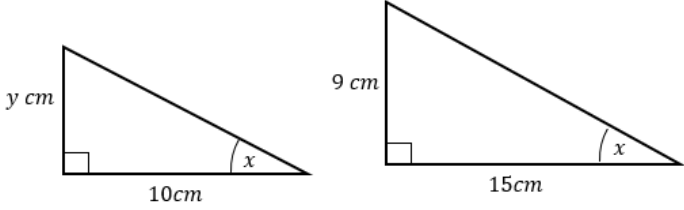
7	<p>Ten friends arrive at a party. Their arrival increases the number of people at the party by 125% In total, how many people are now at the party?</p>
8	<p>Work out the value of $(7^{10} \div 7^{-2}) \div (7^4 \times 7)$</p>
12	<p>The next term of a sequence is made by subtracting the previous two terms. Which of these sequences follows this rule?</p> <p style="text-align: center;"> $-8, 3, -11, -2, -13$ $-2, 5, -7, 12, -5$ $0, -4, 4, -8, 12$ $-1, -1, 0, -1, 2$ </p>
16	<p>Simplify fully</p> $\frac{2x - 6}{5x^2 - 15x}$

Exam Q #	Homework 5 – Paper 2 (Calculator)
1	<p>Circle the point that lies on the curve $y = x^2 - 9x + 1$</p> <p style="text-align: center;">(-2, 23) (-2, 15) (-2, -21) (-2, -4)</p>
2	<p>The height of a man is 1.8 metres, correct to one decimal place. Circle the error interval.</p> <p style="text-align: center;"> $1.75 \text{ m} \leq \text{height} \leq 1.85 \text{ m}$ $1.75 \text{ m} \leq \text{height} < 1.85 \text{ m}$ $1.75 \text{ m} < \text{height} \leq 1.85 \text{ m}$ $1.75 \text{ m} < \text{height} < 1.85 \text{ m}$ </p>
3	<p>$3a$ is four times bigger than b.</p> <p>Circle the ratio $a : b$</p> <p style="text-align: center;">3 : 1 4 : 1 2 : 3 4 : 3</p>
4	<div style="text-align: center;">  </div> <p>Which of these represents the shaded region? Circle your answer.</p> <p style="text-align: center;"> $(A \cap B)'$ $A' \cap B$ $A \cup B'$ $A \cap B$ </p>

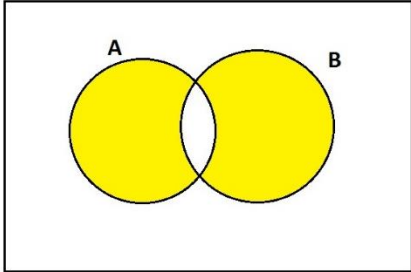
8	<p>On the axes, sketch the curve $y = x^2 - 1$</p> <p>You must show the coordinates of y-intercept.</p> 	Extra	<p>On the axes, sketch the curve $y = 3x + 6$</p> <p>You must show the coordinate of the y-intercept and the x intercept</p> 												
9a	<p>Circle the two words that describe the data</p> <p>Continuous Discrete</p> <p>Grouped Ungrouped</p>	<table border="1" data-bbox="794 1133 1386 1402"> <thead> <tr> <th>Age, y (years)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>12</td> </tr> <tr> <td>3</td> <td>17</td> </tr> <tr> <td>4</td> <td>2</td> </tr> <tr> <td>5</td> <td>9</td> </tr> <tr> <td>6</td> <td>10</td> </tr> </tbody> </table>		Age, y (years)	Frequency	2	12	3	17	4	2	5	9	6	10
Age, y (years)	Frequency														
2	12														
3	17														
4	2														
5	9														
6	10														
9b	<p>What is the median age?</p>														
extra	<p>Which is the modal age?</p>														
10	<p>x is an integer.</p> <p style="text-align: center;">$-1 < x \leq 7$ and $2 \leq x + 1 < 9$</p> <p>Work out all the possible values of x.</p>														

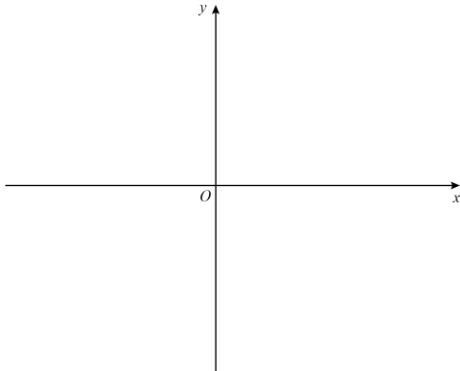
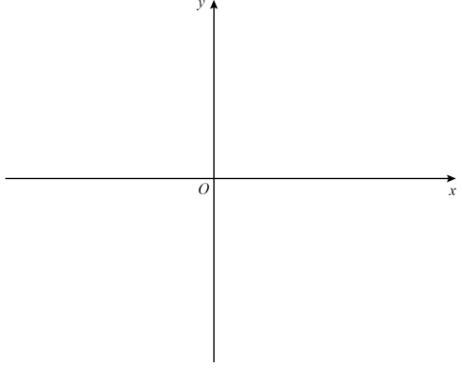
Exam Q #	Homework 6 – Paper 3 (Calculator)
1	<p>Work out £2.40 as a fraction of 12p</p> <p style="text-align: center;"> $\frac{2}{1}$ $\frac{12}{240}$ $\frac{6}{14}$ $\frac{20}{1}$ </p>
2	<p>For a biased dice, $P(1) = \frac{1}{7}$</p> <p>Circle the probability of two ones when the dice is rolled twice.</p> <p style="text-align: center;"> $\frac{2}{7}$ $\frac{2}{14}$ $\frac{1}{14}$ $\frac{1}{49}$ </p>
3	<p>Circle the lowest common multiple (LCM) of 7, 21 and 35</p> <p style="text-align: center;">35 70 105 350</p>
Extra	<p>Circle the highest common factor (HCF) of 12, 18, 60</p> <p style="text-align: center;">4 6 12 60</p>
4	<p>Circle the two roots of $(x - 7)(x + 7) = 0$</p> <p style="text-align: center;">0 -7 7 -49</p>
Extra	<p>Circle the turning point of $(x + 1)^2 - 9 = 0$</p> <p style="text-align: center;">(-1, -9) (-1, 9) (1, -9) (1, 9)</p>

6	<p>To the nearest pound, Jon has £13 To the nearest 50p, Ellie has £4 Work out the maximum possible total amount of money.</p>												
7	<p>Two solids, J and K, have the same density. Complete the table. Include units in your answers.</p> <table border="1" data-bbox="489 819 1197 1014"> <thead> <tr> <th></th> <th>J</th> <th>K</th> </tr> </thead> <tbody> <tr> <td>Mass</td> <td>4.48kg</td> <td></td> </tr> <tr> <td>Volume</td> <td>8 m³</td> <td>10 m³</td> </tr> <tr> <td>Density</td> <td></td> <td></td> </tr> </tbody> </table>		J	K	Mass	4.48kg		Volume	8 m ³	10 m ³	Density		
	J	K											
Mass	4.48kg												
Volume	8 m ³	10 m ³											
Density													
Extra	<p>Rearrange $y = \frac{3x}{7}$ to make x the subject.</p> <p style="text-align: center;"> $x = y + 4$ $x = 7y - 3$ $x = \frac{7y}{3}$ $x = 21y$ </p>												
8	<p>Rearrange $y = \frac{x}{3} + 4$ to make x the subject.</p> <p style="text-align: center;"> $x = 3y - 4$ $x = 3y + 4$ $x = \frac{y-4}{3}$ $x = 3(y - 4)$ </p>												

Exam Q #	Homework 7 – Paper 1 (Non Calculator)
1	 <p style="text-align: center;">3cm 4cm 4.5cm 6cm</p>
2	<p>Work out the value of $\left(2\frac{1}{2}\right)^2$</p> <p style="text-align: center;">$4\frac{1}{4}$ $4\frac{1}{4}$ $6\frac{1}{4}$ $6\frac{1}{2}$</p>
3	<p>Work out the arc length, in metres, of a semicircle of diameter of 9 metres.</p> <p style="text-align: center;">3π 4.5π 9π 18π</p>
4	<p>Circle the fraction that is equivalent to 8.75</p> <p style="text-align: center;">$\frac{8}{4}$ $\frac{8}{75}$ $\frac{35}{4}$ $\frac{35}{8}$</p>
5a	<p>Write four million, three hundred thousand in standard form.</p>
5b	<p>Work out</p> $\frac{1 \times 10^{-6}}{8 \times 10^2}$ <p>Give your answer as an ordinary number</p>

7	<p>Nine friends arrive at a party. Their arrival increases the number of people at the party by 10% In total, how many people are now at the party?</p>
8	<p>Work out the value of $(3^{-10} \div 3^4) \times (3^3 \times 3)$</p>
12	<p>The next term of a sequence is made by adding the previous two terms. Which of these sequences follows this rule?</p> <p style="text-align: center;"> $-9, 3, -6, -9, -15$ $-20, 7, -13, -5, 18$ $10, -4, 6, 2, 8$ $-1, -11, 12, 1, 13$ </p>
16	<p>Simplify fully</p> $\frac{2x^2 - 8x}{7x - 28}$

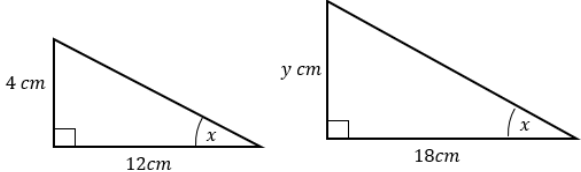
Exam Q #	Homework 8 – Paper 2 (Calculator)
1	<p>Circle the point that lies on the curve $y = 2x^2 - x + 5$</p> <p style="text-align: center;">(-1,10) (-1, 8) (-1, 6) (-1, 0)</p>
2	<p>The height of a tree is 15 metres, correct to the nearest metre. Circle the error interval.</p> <p style="text-align: center;"> $14.5 \text{ m} \leq \text{height} < 15.4 \text{ m}$ $14.5 \text{ m} \leq \text{height} \leq 15.4 \text{ m}$ $14.5 \text{ m} \leq \text{height} < 15.5 \text{ m}$ $14.5 \text{ m} \leq \text{height} \leq 15.5 \text{ m}$ </p>
3	<p>$2a$ is five times bigger than b.</p> <p>Circle the ratio $a : b$</p> <p style="text-align: center;">5 : 2 2 : 5 10 : 1 1 : 10</p>
4	<div style="text-align: center;">  </div> <p>Which of these represents the shaded region? Circle your answer.</p> <p style="text-align: center;"> $A \cap B$ $(A \cap B)'$ $A \cap B'$ $A' \cup B$ </p>

8	<p>On the axes, sketch the curve</p> $y = 2^x$ 	<p>On the axes, sketch the curve</p> $y = -x^2 + 4$ <p>You must show the coordinate of y-intercept</p> 												
9a	<p>Circle the two words that describe the data</p> <p>Continuous Discrete</p> <p>Grouped Ungrouped</p>	<table border="1" data-bbox="810 1137 1385 1406"> <thead> <tr> <th>Age, y (years)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>$0 < t \leq 2$</td> <td>3</td> </tr> <tr> <td>$3 < t \leq 5$</td> <td>9</td> </tr> <tr> <td>$6 < t \leq 8$</td> <td>10</td> </tr> <tr> <td>$9 < t \leq 11$</td> <td>14</td> </tr> <tr> <td>$12 < t \leq 14$</td> <td>14</td> </tr> </tbody> </table>	Age, y (years)	Frequency	$0 < t \leq 2$	3	$3 < t \leq 5$	9	$6 < t \leq 8$	10	$9 < t \leq 11$	14	$12 < t \leq 14$	14
Age, y (years)	Frequency													
$0 < t \leq 2$	3													
$3 < t \leq 5$	9													
$6 < t \leq 8$	10													
$9 < t \leq 11$	14													
$12 < t \leq 14$	14													
9b	<p>Which class interval contains the median</p>													
extra	<p>Which is the modal class?</p>													
10	<p>x is an integer.</p> $-2 < \frac{x}{2} \leq 3 \quad \text{and} \quad 1 \leq x + 3 < 9$ <p>Work out all the possible values of x.</p>													

Exam Q #	Homework 9 – Paper 3 (Calculator)
1	<p>Work out £0.66 as a fraction of 30p</p> <p style="text-align: center;"> $\frac{2}{1}$ $\frac{11}{5}$ $\frac{5}{11}$ $\frac{66}{3}$ </p>
2	<p>For a biased dice, $P(3) = \frac{1}{9}$</p> <p>Circle the probability of two threes when the dice is rolled twice.</p> <p style="text-align: center;"> $\frac{2}{9}$ $\frac{2}{18}$ $\frac{9}{81}$ $\frac{1}{81}$ </p>
3	<p>Circle the lowest common multiple (LCM) of 8, 16 and 20</p> <p style="text-align: center;">8 16 80 160</p>
Extra	<p>Circle the highest common factor (HCF) of 9, 18, 21</p> <p style="text-align: center;">1 2 3 9</p>
4	<p>Circle the two roots of $(x + 3)(x + 9) = 0$</p> <p style="text-align: center;">-3 -9 3 9</p>
Extra	<p>Circle the turning point of $(x + 7)^2 + 1 = 0$</p> <p style="text-align: center;">(-7, -1) (7, 1) (7, -1) (-7, 1)</p>

6	<p>To the nearest pound, Jon has £4 To the nearest 50p, Ellie has £1.50 Work out the maximum possible total amount of money.</p>												
7	<p>Two solids, J and K, have the same density. Complete the table. Include units in your answers.</p> <table border="1" data-bbox="489 819 1197 1014"> <thead> <tr> <th></th> <th>J</th> <th>K</th> </tr> </thead> <tbody> <tr> <td>Mass</td> <td>66g</td> <td>93.5g</td> </tr> <tr> <td>Volume</td> <td>12 cm³</td> <td></td> </tr> <tr> <td>Density</td> <td></td> <td></td> </tr> </tbody> </table>		J	K	Mass	66g	93.5g	Volume	12 cm ³		Density		
	J	K											
Mass	66g	93.5g											
Volume	12 cm ³												
Density													
Extra	<p>Rearrange $y = x^2 - 2$ to make x the subject.</p> <p style="text-align: center;"> $x = y + 2$ $x = \frac{y+2}{2}$ $x = \sqrt{y+2}$ $x = \sqrt{y-2}$ </p>												
8	<p>Rearrange $y = \frac{x}{y+4}$ to make x the subject.</p> <p style="text-align: center;"> $x = y + (y + 4)$ $x = y(y - 4)$ $x = y^2 + 4$ $x = y^2 + 4y$ </p>												



Exam Q #	Homework 10 – Paper 1 (Non Calculator)
1	 <p style="text-align: center;">10cm 12cm 6cm 8cm</p>
2	<p>Work out the value of $\left(1\frac{3}{5}\right)^2$</p> <p style="text-align: center;">$1\frac{9}{25}$ $2\frac{9}{25}$ $2\frac{14}{25}$ $2\frac{2}{6}$</p>
3	<p>Work out the arc length, in metres, of a semicircle of radius 6 metres.</p> <p style="text-align: center;">3π 6π 12π 36π</p>
4	<p>Circle the fraction that is equivalent to 2.5</p> <p style="text-align: center;">$\frac{2}{5}$ $\frac{25}{10}$ $\frac{125}{3}$ $\frac{28}{8}$</p>
5a	<p>Write 0.00604 in standard form.</p>
5b	<p>Work out</p> $\frac{3 \times 10^7}{4 \times 10^3}$ <p>Give your answer as an ordinary number</p>

7	<p>20 friends arrive at a party. Their arrival increases the number of people at the party by 25% In total, how many people are now at the party?</p>
8	<p>Work out the value of $(3^5 \div 3^4) \div (3^2 \times 3)$</p>
12	<p>The next term of a sequence is made by adding the previous two terms. Which of these sequences follows this rule?</p> <p style="text-align: center;"> $0, -4, -4, -8, -5$ $-2, 5, -3, 2, -1$ $-8, 3, -5, -2, -7$ $-1, -1, -2, -3, 1$ </p>
16	<p>Simplify fully</p> $\frac{6x - 15x^2}{10x - 4}$