

TRIAL AND IMPROVEMENT METHOD

Pearson Edexcel - Thursday 9 June 2016 - Paper 2 (Calculator) Higher Tier

1.

7		<table border="1"> <thead> <tr> <th>x</th> <th>$x^3 - 5x$</th> </tr> </thead> <tbody> <tr><td>3</td><td>12</td></tr> <tr><td>4</td><td>44</td></tr> <tr><td>3.1</td><td>14.(291)</td></tr> <tr><td>3.2</td><td>16.(768)</td></tr> <tr><td>3.3</td><td>19.(437)</td></tr> <tr><td>3.4</td><td>22.(304)</td></tr> <tr><td>3.5</td><td>25.(375)</td></tr> <tr><td>3.6</td><td>28.(656)</td></tr> <tr><td>3.7</td><td>32.(153)</td></tr> <tr><td>3.8</td><td>35.(872)</td></tr> <tr><td>3.9</td><td>39.(819)</td></tr> <tr><td>3.75</td><td>33.9(84..)</td></tr> <tr><td>3.76</td><td>34.3(57..)</td></tr> <tr><td>3.77</td><td>34.7(32..)</td></tr> <tr><td>3.78</td><td>35.1(10..)</td></tr> <tr><td>3.79</td><td>35.4(89..)</td></tr> </tbody> </table>	x	$x^3 - 5x$	3	12	4	44	3.1	14.(291)	3.2	16.(768)	3.3	19.(437)	3.4	22.(304)	3.5	25.(375)	3.6	28.(656)	3.7	32.(153)	3.8	35.(872)	3.9	39.(819)	3.75	33.9(84..)	3.76	34.3(57..)	3.77	34.7(32..)	3.78	35.1(10..)	3.79	35.4(89..)	3.8	4	<p>B2 for a trial $3.7 \leq x \leq 3.8$ evaluated (B1 for a trial $3 \leq x \leq 4$ evaluated) B1 for a different trial $3.75 \leq x < 3.8$ evaluated B1 (dep on at least one previous B1) for 3.8</p> <p>Accept trials correct to the nearest whole number (rounded or truncated) if the value of x is to 1 dp but correct to 1dp (rounded or truncated) if the value of x is to 2 dp.</p> <p>NB: no working scores no marks even if the answer is correct.</p>
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Pearson Edexcel - Monday 8 June 2015 - Paper 2 (Calculator) Higher Tier

2.

2		<table border="1"> <thead> <tr> <th>x</th> <th>$x^3 - x^2$</th> </tr> </thead> <tbody> <tr><td>3</td><td>18</td></tr> <tr><td>3.1</td><td>20.(181)</td></tr> <tr><td>3.2</td><td>22.(528)</td></tr> <tr><td>3.3</td><td>25.(047)</td></tr> <tr><td>3.4</td><td>27.(744)</td></tr> <tr><td>3.5</td><td>30.(625)</td></tr> <tr><td>3.6</td><td>33.(696)</td></tr> <tr><td>3.7</td><td>36.(963)</td></tr> <tr><td>3.8</td><td>40.(432)</td></tr> <tr><td>3.9</td><td>44.(109)</td></tr> <tr><td>4</td><td>48</td></tr> <tr><td>3.45</td><td>29.1(61125)</td></tr> <tr><td>3.46</td><td>29.4(50136)</td></tr> <tr><td>3.47</td><td>29.7(41023)</td></tr> <tr><td>3.48</td><td>30.0(33792)</td></tr> <tr><td>3.49</td><td>30.3(28449)</td></tr> </tbody> </table>	x	$x^3 - x^2$	3	18	3.1	20.(181)	3.2	22.(528)	3.3	25.(047)	3.4	27.(744)	3.5	30.(625)	3.6	33.(696)	3.7	36.(963)	3.8	40.(432)	3.9	44.(109)	4	48	3.45	29.1(61125)	3.46	29.4(50136)	3.47	29.7(41023)	3.48	30.0(33792)	3.49	30.3(28449)	3.5	4	<p>B2 for a trial $3.4 \leq x \leq 3.5$ evaluated correctly (B1 for a trial evaluated correctly for $3 \leq x \leq 4$)</p> <p>B1 for a different trial evaluated correctly for $3.45 \leq x < 3.5$</p> <p>B1 (dep on at least one previous B1) for 3.5</p> <p>[Note: Trials should be evaluated to at least accuracy shown in table, truncated or rounded]</p> <p>[NB No working scores 0 marks]</p>
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Pearson Edexcel - Friday 7 November 2014 - Paper 2 (Calculator) Higher Tier

3.

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Pearson Edexcel - Friday 14 June 2013 - Paper 2 (Calculator) Higher Tier

4.

10	<table border="1"> <thead> <tr> <th>x</th> <th>$x^3 + 2x$</th> </tr> </thead> <tbody> <tr><td>4</td><td>72</td></tr> <tr><td>4.1</td><td>77.(121)</td></tr> <tr><td>4.2</td><td>82.(488)</td></tr> <tr><td>4.3</td><td>88.(107)</td></tr> <tr><td>4.4</td><td>93.(984)</td></tr> <tr><td>4.5</td><td>100.(125)</td></tr> <tr><td>4.6</td><td>106.(536)</td></tr> <tr><td>4.7</td><td>113.(223)</td></tr> <tr><td>4.8</td><td>120.(192)</td></tr> <tr><td>4.9</td><td>127.(449)</td></tr> <tr><td>5</td><td>135</td></tr> <tr><td> </td><td> </td></tr> <tr><td>4.65</td><td>109.8(44625)</td></tr> <tr><td>4.66</td><td>110.5(14696)</td></tr> <tr><td>4.67</td><td>111.1(87563)</td></tr> <tr><td>4.68</td><td>111.8(63232)</td></tr> <tr><td>4.69</td><td>112.5(41709)</td></tr> </tbody> </table>	x	$x^3 + 2x$	4	72	4.1	77.(121)	4.2	82.(488)	4.3	88.(107)	4.4	93.(984)	4.5	100.(125)	4.6	106.(536)	4.7	113.(223)	4.8	120.(192)	4.9	127.(449)	5	135			4.65	109.8(44625)	4.66	110.5(14696)	4.67	111.1(87563)	4.68	111.8(63232)	4.69	112.5(41709)	4.7	4	<p>B2 for a trial $4.6 \leq x \leq 4.7$ evaluated correctly (B1 for a trial evaluated correctly for $4 \leq x \leq 5$) B1 for a different trial evaluated correctly for $4.65 \leq x < 4.7$ B1 (dep on at least one previous B1) for 4.7</p> <p>[Note: Trials should be evaluated to at least accuracy shown in table, truncated or rounded]</p> <p>No working scores 0 marks</p>
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Pearson Edexcel - Monday 4 March 2013 - Paper 2 (Calculator) Higher Tier

5.

8	<table border="1"> <thead> <tr> <th>x</th> <th>$x^3 - 3x$</th> </tr> </thead> <tbody> <tr><td>2</td><td>2</td></tr> <tr><td>2.1</td><td>2.(961)</td></tr> <tr><td>2.2</td><td>4.(048)</td></tr> <tr><td>2.3</td><td>5.(267)</td></tr> <tr><td>2.4</td><td>6.(624)</td></tr> <tr><td>2.5</td><td>8.(125)</td></tr> <tr><td>2.6</td><td>9.(776)</td></tr> <tr><td>2.7</td><td>11.(583)</td></tr> <tr><td>2.8</td><td>13.(552)</td></tr> <tr><td>2.9</td><td>15.6(89)</td></tr> <tr><td>3</td><td>18</td></tr> <tr><td> </td><td> </td></tr> <tr><td>2.85</td><td>14.5(99...)</td></tr> <tr><td>2.86</td><td>14.8(13...)</td></tr> <tr><td>2.87</td><td>15.0(29...)</td></tr> <tr><td>2.88</td><td>15.2(47...)</td></tr> <tr><td>2.89</td><td>15.4(67...)</td></tr> </tbody> </table>	x	$x^3 - 3x$	2	2	2.1	2.(961)	2.2	4.(048)	2.3	5.(267)	2.4	6.(624)	2.5	8.(125)	2.6	9.(776)	2.7	11.(583)	2.8	13.(552)	2.9	15.6(89)	3	18			2.85	14.5(99...)	2.86	14.8(13...)	2.87	15.0(29...)	2.88	15.2(47...)	2.89	15.4(67...)	2.9	4	<p>B2 for a trial $2.8 \leq x \leq 2.9$ evaluated correctly (B1 for a trial evaluated correctly for $2 \leq x \leq 3$)</p> <p>B1 for a different trial evaluated correctly for $2.85 \leq x < 2.9$</p> <p>B1 (dep on at least one previous B1) for 2.9</p> <p>NB For trials where x has one decimal place: $x \leq 2.6$ trials must be evaluated to at least 1 sf truncated or rounded $2.6 < x < 2.85$ trials must be evaluated to at least 2 sf truncated or rounded</p> <p>$2.85 \leq x \leq 2.9$ trials must be evaluated to at least 3 sf truncated or rounded</p> <p>NB. Accept 15 or 15.0 for trial at $x = 2.87$</p> <p>No working scores 0 marks.</p> <p>If candidate is clearly working with $x^3 - 3x - 15 = 0$ then use same scheme as above but subtract 15 from all evaluated values in the table</p>
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Pearson Edexcel - Thursday 8 November 2012 - Paper 2 (Calculator) Higher Tier

6.

11	(a)		show	2	M1 for $x \times x \times x$ or $2 \times 5 \times x$ or vol of cube = x^3 or vol cuboid = $10x$ A1 correct completion leading to $x^3 - 10x = 100$																																					
	(b)	<table border="1"> <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>	$x = 1$	-9	$x = 2$	-2	$x = 3$	-3	$x = 4$	24	$x = 5$	75	$x = 6$	156	$x = 10$	900	$x = 5.1$	81.(651)	$x = 5.2$	88.(608)	$x = 5.3$	95.(877)	$x = 5.4$	103.(464)	$x = 5.5$	111.(375)	$x = 5.6$	119.(616)	$x = 5.7$	128.(193)	$x = 5.8$	137.(112)	$x = 5.9$	146.(379)	$x = 5.35$	99.6(30375)	$x = 5.36$	100.3(90656)	$x = 5.355$	100.0(101139)	5.4	4
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Pearson Edexcel - Wednesday 13 June 2012 - Paper 2 (Calculator) Higher Tier

7.

11	<p>$x = 4$ gives 40 $x = 5$ gives 95 $x = 4.1$ gives 44.(321) $x = 4.2$ gives 48.(888) $x = 4.3$ gives 53.(707) $x = 4.4$ gives 58.(784) $x = 4.5$ gives 64.(125) $x = 4.6$ gives 69.(736) $x = 4.7$ gives 75.(623) $x = 4.8$ gives 81.(792) $x = 4.9$ gives 88.(249) $x = 4.61$ gives 70.3(12..) $x = 4.62$ gives 70.8(91..) $x = 4.63$ gives 71.4(72..) $x = 4.64$ gives 72.0(57..) $x = 4.65$ gives 72.6(44..)</p>	4.6	4	B2 for a trial $4.6 \leq x \leq 4.7$ evaluated (B1 for a trial $4 \leq x \leq 5$ evaluated) B1 for a different trial $4.6 < x \leq 4.65$ evaluated B1 (dep on at least one previous B1) for 4.6 Accept trials correct to the nearest whole number (rounded or truncated) if the value of x is to 1 dp but correct to 1dp (rounded or truncated) if the value of x is to 2 dp. (Accept 72 for $x = 4.64$) NB : no working scores no marks even if the answer is correct.
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Pearson Edexcel - Monday 5 March 2012 - Paper 4 (Calculator) Higher Tier

8.

6	<p>$x = 3$ gives 36 $x = 4$ gives 76 $x = 3.1$ gives 39.(091) $x = 3.2$ gives 42.(368) $x = 3.3$ gives 45.(837) $x = 3.4$ gives 49.(504) $x = 3.5$ gives 53.(375) $x = 3.6$ gives 57.(456) $x = 3.7$ gives 61.(753) $x = 3.8$ gives 66.(272) $x = 3.9$ gives 71.(019) $x = 3.15$ gives 40.7(05875) $x = 3.16$ gives 41.0(34496) $x = 3.17$ gives 41.3(65013) $x = 3.18$ gives 41.6(97432) $x = 3.19$ gives 42.0(31759)</p>	3.2	4	B2 for a trial $3.1 \leq x \leq 3.2$ (B1 for trial $3 \leq x \leq 4$) B1 for a different trial $3.15 \leq x < 3.2$ B1 (dep on at least one previous B1) for 3.2 Accept trials correct to the nearest whole number (rounded or truncated) if the value of x is to 1 dp but to 1dp (rounded or truncated) if the value of x is to 2 dp NB: no working scores no marks, even if the answer is correct.
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Pearson Edexcel - Friday 10 June 2011 - Paper 4 (Calculator) Higher Tier

9.

12	<table border="1"> <thead> <tr> <th>x</th> <th>$x^3 + 5x$</th> </tr> </thead> <tbody> <tr><td>3</td><td>42</td></tr> <tr><td>3.4</td><td>56.(304)</td></tr> <tr><td>3.5</td><td>60.(375)</td></tr> <tr><td>3.6</td><td>64.(656)</td></tr> <tr><td>3.7</td><td>69.(153)</td></tr> <tr><td>3.8</td><td>73.(872)</td></tr> <tr><td>3.9</td><td>78.(819)</td></tr> <tr><td>4</td><td>84</td></tr> <tr><td>3.65</td><td>66.8(77)</td></tr> <tr><td>3.66</td><td>67.3(27)</td></tr> <tr><td>3.67</td><td>67.7(80)</td></tr> <tr><td>3.68</td><td>68.2(36)</td></tr> <tr><td>3.69</td><td>68.6(93)</td></tr> </tbody> </table>	x	$x^3 + 5x$	3	42	3.4	56.(304)	3.5	60.(375)	3.6	64.(656)	3.7	69.(153)	3.8	73.(872)	3.9	78.(819)	4	84	3.65	66.8(77)	3.66	67.3(27)	3.67	67.7(80)	3.68	68.2(36)	3.69	68.6(93)	3.7	4	<p>B2 for a trial between 3 and 4 exclusive (B1 for a trial between 3 and 4 inclusive) B1 for a different trial of $3.65 \leq x < 3.7$ B1 (dep on at least one previous B1) for 3.7</p> <p>NB Trials should be evaluated to at least 2 s.f truncated or rounded for values of x correct to 1 dp. Trials should be evaluated to at least 1 dp for values of x correct to 2 dp truncated or rounded. No working scores 0 marks</p>
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Pearson Edexcel - Friday 11 June 2010 - Paper 4 (Calculator) Higher Tier

10.

8	$x = 1$ gives 11 $x = 2$ gives 28 $x = 1.5$, gives 18.(375) $x = 1.6$, gives 20.(096) $x = 1.7$, gives 21.(913) $x = 1.8$, gives 23.(832) $x = 1.9$, gives 25.(859) $x = 1.85$, gives 24.8(316..) $x = 1.86$, gives 25.(03..) $x = 1.87$, gives 25.2(3..) $x = 1.88$, gives 25.4(4..) $x = 1.89$, gives 25.6(5..) 	1.9	4	<p>B2 for a trial $1.8 \leq x \leq 1.9$ evaluated (B1 for a trial $1 \leq x \leq 2$ evaluated) B1 for a different trial $1.85 \leq x < 1.9$ evaluated B1 (dep on at least one previous B1) for 1.9</p> <p>Accept trials correct to the nearest whole number (rounded or truncated) if the value of x is to 1dp but correct to 1dp (rounded or truncated) if the value of x is to 2dp.</p> <p>NB: no working scores no marks even if answer is correct.</p>
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Pearson Edexcel - Tuesday 10 November 2009 - Paper 4 (Calculator) Higher Tier

11.

14	$3 \rightarrow 33$ $4 \rightarrow 72$ $3.1 \rightarrow 35.9(91)$ $3.2 \rightarrow 39.1(68)$ $3.3 \rightarrow 42.5(37)$ $3.4 \rightarrow 46.1(04)$ $3.5 \rightarrow 49.8(75)$ $3.6 \rightarrow 53.8(56)$ $3.7 \rightarrow 58.0(53)$ $3.8 \rightarrow 62.4(72)$ $3.9 \rightarrow 67.1(19)$ $3.75 \rightarrow 60.2(34375)$	3.7	4	<p>B2 for a trial between 3.7 and 3.8 inclusive (B1 for a trial between 3 and 4 inclusive)</p> <p>B1 for a different trial between 3.7 and 3.8 exclusive</p> <p>B1 (dep on at least one previous B1) for 3.7</p> <p>NB Trials should be evaluated to at least 1dp truncated or rounded</p>
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AQA GCSE – Sample Paper 1 (Non - Calculator) Higher Tier

12.

22	Full evaluation	B2	<p>Either gives a correct solution eg divide area by 6 (to work out area of one face of cube A)</p> <p>calculate the square root of the answer (to work out length of one edge of cube A)</p> <p>halve this length (to work out length of edge on cube B)</p> <p>then cube this answer (to work out the volume of cube B)</p> <p>or states or implies that if Steph's order is maintained eg would need to quarter the surface area (to work out surface area of cube B)</p> <p>B1 for partial evaluation eg order is incorrect or 1st line is incorrect</p>
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