

Practice Paper 2

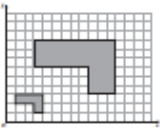
June 2015

Higher Tier

Edexcel Style

Mark Scheme

Commissioned by The PiXL Club Ltd.

1a	300	2	M1 for 3x100 A1 cao																												
1b	24	2	M1 for 2 divided by $\frac{1}{2} \times 6$ A1 cao																												
2a	775	2	M1 for 1.25 x620 oe A1 cao																												
2b	2	3	M1 for 50/1.25 M1 for 42 - '40' A1 cao																												
3	2.42927(0474)	2	B2 for 2.42927 or better (B1 for 19.56 or 8.0518 seen or 2.43 or 2.429 or 2.4292 or 2.4293 or digits 242927... or $\frac{97800}{40259}$ seen)																												
4	2, 5, 10	2	M1 for $1^2 + 1$ $2^2 + 1$ $3^2 + 1$ A1																												
5	37.7	2	M1 for $\pi \times 12$ A1 37.6 to 37.8																												
6	Correct 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																												
7		3	B3 for correct enlargement in correct position (B2 for enlargement SF 3 in incorrect position or enlargement, centre O, but different scale factor) (B1 for 4 lines enlarged by SF 3 or enlargement, not from O, different scale factor)																												
8	2.6	4	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																												
			<table border="1"> <tbody> <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> </tbody> </table>	2	48	3	87	2.5	65.(625)	2.6	69.(576)	2.7	73.(683)	2.65	71.6(09)	2.61	69.9(79)	2.62	70.3(84)	2.63	70.7(91)	2.64	71.1(99)	2.66	72.(021)	2.67	72.4(34)	2.68	72.8(48)	2.69	73.2(65)
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9	Correct construction	2	M1 for arcs from same centre on 2 lines at same distance from meeting point ($\pm 2\text{mm}$) A1 for bisector ($\pm 2^\circ$) and correct arcs SC: B1 for bisector ($\pm 2^\circ$) with no arcs, or incorrect arcs if M0 awarded. Accept bisectors that are dashed or dotted.																												

10	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 $\Sigma fx + \Sigma f$ A1 for 12.97 - 13.48 with no arithmetic errors
11a	$5x - 2$	2	M1 expanding brackets A1
11b	$x^2 + x - 12$	2	M1 for 3 of the 4 terms from expanding brackets correct A1
12a	1.55×10^4	1	B1
12b	0.00248	1	B1
12c	1.96×10^8	2	B2 both correct B1 one of the two elements correct
13a	9, -3, 3	2	B2 all three correct B1 for one or two correct
13b	correct graph	2	B1 points correct B1 joined with a correct straight line
14a	£4867.20	3	M1 for 4500×1.04 or for $4500 + 0.04 \times 4500$ or for 4680 or 180 or 360 or 4860 M1 (dep) '4680' $\times 1.04$ or for '4680' + $0.04 \times$ '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]
14b	5	2	M1 for an attempt to evaluate 2400×1.075^n for at least one value of n (not equal to 1) or $3445.51 \div 1.075^n$ ($n \geq 2$) or $\frac{3445.51}{2400}$ (=1.4356...) and 1.075^n evaluated, $n \geq 2$ A1 for 5 cao
15	$x = 3$ $y = -2$	3	M1 for eliminating one variable M1 substituting in for second variable A1 both correct
16	4.16 -2.27	3	M1 substituting into formula M1 for $x = 17 \pm \sqrt{3349} / 18$ A1
17a	51.3 – 51.35	3	M1 for $\cos x = 5/8$ M1 for using inverse cos A1
17b	10.4 – 10.5	3	M1 for $\tan 40 = y/12.5$ M1 $12.5 \times \tan 40$ A1
18	151	3	M1 understanding sale price = 88% M1 dividing by 0.88 A1
19a	5	2	M1 A1 cao
19b	26 or 27	2	M1 A1 for 26 or 27

20a	0.2, 0.4, 0.4	2	B1 for 0.2 B1 for both 0.4s
20b	0.48	2	M1 for 0.8 x 0.6 A1
21	104	2	M1 for valid method A1
22a	b - a	1	B1
22b	Proof	3	M1 for $\vec{OP} = \vec{OA} + \vec{AP}$ oe or $\vec{OP} = \vec{OB} + \vec{BP}$ oe M1 for $\vec{AP} = \frac{3}{5} \times "(b - a)"$ oe or $\vec{BP} = \frac{2}{5} \times "(a - b)"$ oe A1 for $\mathbf{a} + \frac{3}{5} \times (\mathbf{b} - \mathbf{a})$ oe or $\mathbf{b} + \frac{2}{5} \times (\mathbf{a} - \mathbf{b})$ oe leading to given answer with correct expansion of brackets seen
23a	$y = \frac{x}{50}$	3	M2 for $10 = \frac{500}{k}$ oe M1 for $y = kx$ oe A1
23b	7	1	B1
24	$x = -1$ or $x = 4$	5	M1 multiplying both sides by a common denominator of $(x + 3)(2x - 1)$ oe or $\frac{4(2x - 1) + 3(x + 3)}{(x + 3)(2x - 1)} (= 1)$ or better seen or multiplying all 3 terms by $(x + 3)$ or by $(2x - 1)$ M1 (indep) for $2x^2 - x + 6x - 3$ oe seen or $8x - 4 + 3x + 9$ oe A1 for $2x^2 - 6x - 8$ oe or $x^2 - 3x - 4 (= 0)$ M1 (dep on M2) for correct method to solve a 3 term quadratic A1 cao for both solutions
25a	38.5	2	M1 for $0.5 \times 10.5 \times 8.3 \times \sin 62$ A1 for 38.4 – 38.5
25b	9.86	3	M1 use of cosine rule M1 for correct order of evaluation A1 for 9.86 -9.865
26a	30 60	2	B1 B1
26b	fd = 1.5 fd = 0.5	2	M1 one fd correct A1
27	1.08 as the LB and UB agree to that no of sig fig <hr/> Upper bound $\sqrt{\frac{6.435}{5.5135}} = 1.080340$ Lower bound $\sqrt{\frac{6.425}{5.5145}} = 1.079402$	5	B1 for either 6.435 or 6.425 or 6.434999... B1 for either 5.5145 or 5.5135 or 5.5144999... M1 for '6.435' ÷ '5.5135' where $6.43 < '6.435' \leq 6.44$ and where $5.513 \leq '5.5135' < 5.514$ OR for '6.425' ÷ '5.5145' where $6.42 \leq '6.425' < 6.43$ and where $5.514 < '5.5145' \leq 5.515$ A1 for 1.0794(02...) and 1.0803(40...) A1 for 1.08 and 'both LB and UB round to 1.08' oe

