## **BETWEEN PAPERS'' PRACTICE** SET 1 OF 1 - FEH (MOST QUESTIONS!)

## Summer 2018 EXAMINERS REPORT & MARKSCHEME

NOT A "BEST" GUESS PAPER.

NEITHER IS IT A "PREDICTION" ... ONLY THE EXAMINERS KNOW WHAT IS GOING TO COME UP! FACT! YOU ALSO NEED TO REMEMBER THAT JUST BECAUSE A TOPIC CAME UP ON PAPER 1 OR PAPER 2 IT MAY STILL COME UP ON PAPER 3 ...

WE KNOW HOW IMPORTANT IT IS TO PRACTICE, PRACTICE, PRACTICE .... SO WE'VE COLLATED A LOAD OF QUESTIONS THAT WEREN'T EXAMINED IN THE OCR 9-1 GCSE MATHS PAPER 1 OR PAPER 2 BUT WE CANNOT GUARANTEE HOW A TOPIC WILL BE EXAMINED IN THE NEXT PAPERS ...

Enjoy! Mel & Seager

## Mark scheme

Q	Question		Answer/Indicative content	Marks	Part marks and guidance		
1		i	341.54	1			
		ii	300	1			
			Total	2			
2			3, 12 and 12	6	<b>B1</b> for 3 AND <b>B5</b> for 12 and 12 OR <b>M2</b> for x = 150 Or <b>M1</b> for x + x + 60 = 360 AND <b>M2</b> for 360 ÷ (180 – <i>their x</i> ) <b>oe</b> dependent on previous <b>M1</b> Or <b>M1</b> for 360 ÷ n (0 < n < 180) or for 180 – <i>their x</i>		
			Total	6			
3			* <b>Shows </b> <i>x</i> = <b>135</b> with 4A a complete method, with reasons given to support. Easy to follow	4			
			<ul> <li>3A Shows x = 135 with some method that is easy to follow that is not incorrect or insufficient reasons Or</li> <li>3B Shows a complete correct method,with some reason(s), with one small slip</li> <li>Or</li> <li>3C Seeing a full method that the sum of the angles in an octagon is 1080 (eg a diagram dividing an octagon into 6 triangles and seeing 6 × 180 = 1080)</li> <li>1A Shows one of the following soi</li> <li>Angle [in a] square [is] 90(may be on the diagram)</li> <li>[Angles in a] point/circle/[whole]turn [is] 360</li> <li>Exterior angles [of a polygon sum] is 360</li> <li>[Sum of angles on a straight] line [is] 180</li> <li>[Sum of angles in a] triangle is 180</li> </ul>	3-2	For the lower mark: 2A Shows x = 135 with no method or method that is difficult to follow, necessarily incorrect Or 2B Shows a complete correct method Or 2C Shows two of the following <b>soi</b> • Angle [in a] square [is] 90 (may be on the diagram) • [Angles in a] point/circle/[whole]turn [is] 360 • Exterior angles [of a polygon sum] is 360 • [Sum of angles on a straight] line [is] 180 • [Sum of angles in a] triangle is 180 Or 2D Shows an <b>exterior angle</b> is 45 (360 × 8) Or 2E 1080 seen	but not	
			No relevant method	0	Examiner's Comments To earn full marks on this QWC question a complete method was needed appropriate reasons given to support their method. A few candidates four good solutions that satisfied this standard. Others endeavoured to write o clear method, but their solutions lacked the detail required and, conseque they were unable to gain full marks. Many solutions lacked coherence and difficult to follow, but these often gained some marks for odd pieces of th method or some reasons given. A common error was to assume that the s the angles in an octagon were 360° and then to divide by eight giving an ar of 45°. There were a significant number of candidates who not get started question and offered no response.		
			Total	4			
4			2.8(0)	3	<b>B1</b> for $\tan \theta = \frac{\text{opp}}{\text{adj}}$ M1 for 4 × tan 35		

		Total	3					
5	i	1	1					
	ii	$\frac{\sqrt{3}}{2}$	1					
		Total	2					
6		plan	2	B1 for correct plan with one error such as wrong scale or one dimension incorrect or no diagonals				
				<b>B1</b> for correct elevation with one error such as wrong scale, one dimension incorrect, one point incorrect, missing base to triangle or all correct with extras				
		Front Elevation		If reversed then <b>SC2</b> for both correct or <b>SC1</b> for one correct and the other with one error	allow centre point not at centre			
			2	Examiner's Comments This question was answered well and it was pleasing to see most candidates had the use of the necessary equipment. The most common loss of marks was from having the diagonals missing from the square (on the plan) or no baseline for the triangle (on the elevation). Nearly all candidates knew the difference between a plan and an elevation and there were only a few extra lines in either diagram	in both condone freehand attempt at straight line, otherwise deduct 1 mark in (b) if lines are excessively wavy			
		Total	4					
7		E	1		accept equations in the place of letters			
		A F	1	in either order				
				in either order				
				Examiner's Comments				
		AE	1	Most candidates did not gain full marks here and one confusion was over which number indicated the gradient; those who decided it was the last number gave B as the steepest, A and E as parallel and A and F meeting on the y-axis. Others thought that B and D were parallel, probably because they have the same number as coefficient of x without taking regard of the sign.				
		Total	3					
				<b>B1</b> for correct horizontal or vertical movement <b>SC1</b> for triangle with vertices (-4, 3), (-3, 2), (-2, 4)				
8	i	Correct translation Vertices (–5, 4), (–6, 5), (–4, 6)	2	Examiner's Comments In part (i) most candidates translated the triangle correctly. Some candidates showed a correct displacement in one direction only and a small number reversed the <i>x</i> - and <i>y</i> - displacements.	Clear intention Use overlay			
	ii	(-4, 8) 3	2	B1 for one correct Max 1 mark if second	Condone missing brackets in coordinates, Do not allow a vector			

				transformation mentioned Examiner's Comments In part (ii) many candidates gave the correct centre and scale factor for the enlargement. Some candidates quoted the centre of enlargement as a vector rather than as coordinates and some candidates just gave the scale factor. Candidates who drew rays from B to A were generally more successful in identifying the centre correctly.	Condone 3 times (bigger) or ×3 etc Condone sf +3 Condone 1 : 3 but not 3 : 1
		Total	4		
9		[ <i>x</i> =] 2 [ <i>y</i> =] -1	3	M1 for eliminating one variable M1 for correct substitution of <i>their</i> <i>x</i> or <i>y</i>	
		Total	3		
10		Triangle B correctly positioned Vertices (-4, -2), (-4, -3), (-1, -2)	4	B3 for triangle B with two vertices correct Or for correct rotation followed by translation by 5 left or 1 down Or for correct translation following 90° anticlockwise rotation about origin OR B2 for correct rotation of A clockwise about origin followed by incorrect or no translation Or for 90° anticlockwise rotation about origin followed by translation by 5 left or 1 down OR B1 for rotation of A 90° anticlockwise about origin followed by incorrect or no translation OR SC2 for correct translation following 180° rotation about origin OR SC1 for translation of 5 left or 1 down following 180° rotation about origin Examiner's Comments Many candidates performed the two transformations correctly and drew triangle B in the correct position. Those that didn't reach the correct answer had usually performed the rotation correctly, but made an error in one or both of the directions of the translation. Only very few candidates started by doing an anticlockwise rotation.	Use overlay Accept intention if triangles not labelled Red triangle scores 4 marks, horizontal or vertical translation of red scores B3, any other translation of red scores B2 Green triangle scores B3, horizontal or vertical translation of green scores B1 Blue triangle scores SC2, horizontal or vertical translation of blue scores SC1, any other translation of blue scores SC0
		Total	4		
11		$ \xrightarrow{x} \xrightarrow{x} \xrightarrow{x} \xrightarrow{x} \xrightarrow{x} \xrightarrow{x} \xrightarrow{x} \xrightarrow{x}$	1	both correct, first line any with positive gradient, second line any with negative gradient or horizontal or vertical line	accept any clear intention of correct graphs, ie not ruled but attempt at straight line

			2	both correct, first graph any with two positive solutions, second any with one/no positive solutions Or <b>B1</b> for any one parabola seen <b>Examiner's Comments</b> Understanding of the sign of the gradient of a straight line was good and the majority of candidates sketched a correct pair of lines for this statement. Candidates were less successful in identifying the quadratic graphs correctly, however a good proportion of them could sketch a parabola for this part and so gained some credit. Common misconceptions about the signs of the roots appeared to be that they were related to the <i>y</i> -intercept being positive or negative or to the orientation of the parabola rather than where the curve crossed the <i>x</i> -axis. It was apparent that, as the graphs for the first two statements were linear, some candidates assumed that the third must also be linear.	accept any clear intention of correct graphs, ie not ruled but attempt at straight line Accept any clear intention of correct graphs, ie attempt at parabola Condone more than one parabola on axes for B1		
		Total	3				
12		6 <i>x</i> ( <i>y</i> – 2 <i>x</i> )	2	M1 for a correct partial factorisation eg $6(xy - 2x^2)$ , $x(6y - 12x)$ or $3x(2y - 4x)$ or $2x(3y - 6x)$ or $3(2xy - 4x^2)$ or $2(3xy - 6x^2)$ <b>Examiner's Comments</b> Many failed to take out the full common factor of $6x$ , leaving it only partly factorised.	condone missing final bracket		
		Total	2				
13		350 000	3	M2 for 371 000 ÷ 1.06 oe or M1 for 1.06 or 106% oe seen <u>Examiner's Comments</u> The common error was to find 6% of 3 to this was to write down 106% or 1.0	371 000 and subtract that from it. The key 06 and then the solution was accessible.		
		Total	3				
14		600 ÷ 30 = 20 or 600 ÷ 25 = 24	2	accept 560 ÷ 28 = 20 or 570 or 580 ÷ 30 = 19 (or 19.3 for 580) or 575 ÷ 25 = 23 or 580 ÷ 25 = 23 or 23.2 or 580 ÷ 29 = 20 M1 for 560, 570, 580, 600, 25 or 30 seen Examiner's Comments This question was not answered well because candidates continue to attempt to do the calculation in full and then to round the answer. They must learn to round the original figures to 1 significant figure so that they can do the calculation "in their heads". We would also allow the number of pupils (28) to be rounded to 25 as this was a sensible approximation to use.			
		Total	2				
15	i	46.5 to 48	1		Answer may be seen on the graph		
	ii	42	1		Answer may be seen on the graph		

				Examiner's Comments		
				Most candidates could use the graph to convert pounds into dollars.		
				Some were not careful enough reading off a value and gave an answer of 46 for which they were not awarded the mark.		
		Total	2			
16	а	(x – 3)(x + 3) final answer	1	Examiner's Comments		
				Only better candidates knew how to factorise the quadratic expressions. <b>M1</b> for $(x \pm 3)(x \pm 1)$		
				<b>M1</b> for $(x \pm 3)(x \pm 1)$		
	b	(x - 3)(x - 1) final answer	2	Examiner's Comments		
				Only better candidates knew how to factorise the quadratic expressions.		
	C	<u>x - 1</u>	1	Examiner's Comments		
	C	$\mathbf{X} + 3$ final answer	1	Some wrote their fraction upside down. Many candidates used very spurious algebra to simplify their fraction.		
		Total	4			
17		Fixed rate account, £2751.76 or £2751.75 With fully correct calculations for both accounts shown, clearly laid out and annotated. This may be either total amount in each account or total interest for both accounts linked with account name	5	Bonus account After 1 year: 2500 × 1.035 = 2587.50 After 3 years: 2587.5 × 1.03 <sup>2</sup> = 2745.08 or 2745.07[875] Fixed rate account: After 3 years: 2500 × 1.0325 <sup>3</sup> = 2751.76 or 2751.75[7695]		
		<b>4a</b> Correct calculations for both accounts linked with account names with incorrect conclusion eg interest rather than total		<b>3a</b> Correct amount in one account after 3 years stated or correct calculation fo one account seen with account clearly identified		
		<b>4b</b> Correct conclusion with totals found for both accounts but no calculations or calculations not linked with account names	4–3	<b>3b</b> Total interest for both accounts seen not necessarily linked with account names, $[£]245.08$ and $[£]251.76$		
		<b>4c</b> Clearly laid out and annotated work with one error in calculations or with rounding errors which lead to 2745 (Bonus) and 2751 or 2752 (Fixed) or better and correct FT conclusion		<b>3c</b> Totals for both accounts seen, correct to at least nearest pound, not linked with account names		
		<b>2a</b> One correct total seen [£]2751.76 or [£]2745.08, correct to at least nearest pound		<ul> <li>1a Attempt at correct calculation for one account for at least one year: 2500 ×</li> <li>1.035 oe or 2500 × 1.0325 oe seen</li> </ul>		
		<b>2b</b> Attempt at <b>compound</b> interest calculation for 3 years for one account		<b>1b</b> Attempt to find interest for both accounts for at least one year seen or implied:		
		<b>2c</b> Correct calculations seen for totals in both accounts after at least one year: 2500 × 1.035 <b>oe</b> and 2500 × 1.0325 <b>oe</b>	2–1	3.5% of 2500 or 87.5 or 3% of 2500 or 75 and 3.25% of 2500 or 81.25		
		<b>2d</b> Simple interest calculations for both accounts seen linked withcorrect accounts and answer Fixed Rate, £2743.75		Alternative method: Bonus account after 3 years $1.035 \times 1.03^2 = 1.098[0315]$ Fixed rate account after 3 years $1.0325^3 = 1.100[703078]$		
				Fixed rate is more with $2500 \times 1.0325^3 = \pm 2751.76$		
				Examiner's Comments		
		No worthwhile work attempted Statements are minimum requirement for each mark	0	This question tested the candidates' quality of written communication so they were expected to identify their calculations by more than numerical values and to present them in a logical form leading to a clear conclusion. On the whole presentation is improving in this type of question. Some candidates gained five marks with a minimum of effort producing complete, but concise, working with correct annotation.		
				Many candidates understood that compound interest calculations were required and multiplier methods generally led to correct answers, but in some cases marks were lost because these calculations were not linked with accounts. Candidates who used step-by-step methods to calculate the amounts in the accounts each		

				<ul> <li>year often lost marks due to arithmetic slips or miscopying of numbers.</li> <li>Candidates found it harder to deal with the changing interest rate of the Bonus</li> <li>Account than the constant rate in the Fixed Rate Account. Some incorrect</li> <li>application of the interest rates was seen, with, for example, 1.35 used in place</li> <li>of 1.035.</li> <li>Some candidates worked with simple interest rather than compound interest</li> <li>which meant that a maximum of two marks would be awarded. Other candidates</li> <li>tried to use non-calculator methods to find the percentages which is</li> <li>inappropriate on a calculator paper and seldom led to more than one mark for</li> <li>finding the interest correctly for one year.</li> <li>A number of candidates subtracted the interest from the investment or did not</li> <li>give answers to the nearest penny, demonstrating a lack of understanding of</li> <li>functional mathematics.</li> </ul>			
		Total	5				
18	а	(x + 5)(x - 3) final answer	2	<b>B1</b> for (x ± 5)(x ± 3) seen			
	b	-5, (+)3	FT1	FT from their 2 brackets only			
	c	$\frac{x+5}{x+3}$ final answer	2	<b>B1</b> for $(x + 3)(x - 3)$ seen <b>Examiner's Comments</b> Part (a) was very often correct. Occass wrong or it was treated as an equation candidates only factorised the letter pro- 15. Whilst many gave the two correct valis solution. Some candidates failed to re- and started again, using trial and impro- Better candidates knew to factorise x 'cancelled' the $x^2$ terms either leaving as their answer or going further with	tionally, the s on and solution parts of the e ues, a numb calise the sig rovement or $^2 - 9$ first, th $\frac{2x - 15}{3}$ g - 9 spurious can	signs in the brac ons were found expression and er only gave the nificance of the the quadratic f ough a significa	ckets were . Less aware wrote x(x + 2)– e positive word 'hence' formula. nt number
		Total	5				
19		Valid and explicit approximation method	M1				
		At least 1 value rounded to 1sf 170 to 190	M1 A1	If <b>0</b> scored, allow <b>SC1</b> for 170 to 190 <b>Examiner's Comments</b> A disappointing number of candidates did not attempt to estimate an answer but tried to work out 2.9 × 61p. Of those who did, 3 × 60 = 180p earned marks quite easily.	Expect 3 o Condone p Exact answ Expect £1.	r 60 boor money not ver 176.9p ≈ 17 80 or £1.83	ation 7p
		Total	3				
		Correct working including			Performan	ice	
		Maths and Science identified and				Maths	Science
20		<ul> <li>correct conversions to a form allowing comparisons and</li> <li>correct reference to improvement in both subjects</li> </ul>	4	May be an intended fraction such as (total =) 50 and (score =) 27.5 Accept "Kieran [is] correct" 5% in Maths and 2% in Science	New	60%	72%
					Old	55%	70%
		Two pairs (Maths and Science) correctly converted each to comparable form <b>and</b> • unclear or no conclusion drawn or		One pair (Maths or Science) correctly converted to comparable form <b>Or</b> attempt (using correct		Maths	Science
		<ul> <li>no improvement oe</li> <li>Or attempt (using correct explicit method) to convert</li> </ul>	3–2	explicit method) to convert two pairs (Maths and Science) each to comparable form <b>and</b> incorrectly	New	0.6	0.72
		two pairs (Maths and Science) each to comparable form <b>and</b> correctly interpret <i>their</i> converted results		interpret their converted results	Old	0.55	0.7

		Change one score (fraction) correctly to any different form	1-0	No scores correctly converted or no correct evidence Examiner's Comments Responses to this question were polarised. Some ingenious methods were used to compare the scores but most who answered correctly used percentages. Where errors were made, the majority were in converting 18 out of 25; 75% was a common wrong answer. Most of the candidates who scored no marks concentrated only on how many questions were wrong.	New Old Condone <sup>4</sup> correct co New Old	Maths           60           100           55           100           "false" fractior           mparison eg           Maths           30           50           27.5           50	Science $\frac{36}{50}$ or $\frac{72}{100}$ $\frac{35}{50}$ or $\frac{70}{100}$ sthat allow           Science $\frac{18}{25}$ $\frac{17.5}{25}$
		Total	4				
21		Use of 6000 and 1 at any stage	B1				
		$5940 \div their \pi \times 1[.06]^2$					
		or 6000 ÷ <i>their</i> $\pi \times 1[.06]^2$	Δ1				
		Total	4				
22		6184.75 or 6184.74 or 6184.76 final answer	3	M2 for 5760 × 1.024 <sup>3</sup> oe OR M1 for 5760 × 1.024 <sup>9</sup> oe Or for 5760 × their 1.024 <sup>3</sup> oe After M0, SC1 for answer 6174.72 Examiner's Comments Candidates were more successful in carrying out the compound interest calculation. Those who used the formula generally reached the correct answer. Candidates who approached the solution using less efficient year-on-year calculations sometimes used incorrect or inappropriate rounding of intermediate values or had transcription errors in their working which led to an inaccurate final answer. This method often included breaking down the percentage into 10%, 2% and 0.4% which led to errors. Some candidates used an incorrect multiplier of 0.24, 1.24 or 2.4 and others used simple interest rather than compound interest. A small number of candidates carried out a percentage reduction calculation. In this question if candidates had checked whether their answer was reasonable it would have led many to realise that they must have made an error as an answer of £5355.15 is clearly wrong as it is less than the starting amount	Implied by answer 6184.74 to 6184 Allow M2 for step by step method f total after exactly 3 years Where $n \ge 1$ , $n \ne 3$ M1 implied by 5898.24 seen Where $1 < their 1.024 < 2$		274 to 6184.8 ap method for seen 2

				and an answer of £79 626.24 is clearly wrong as it is far too large.				
		Total	3					
				Examiner's Comments				
23		610 cao	1	Generally well attempted, however a number of responses were 610.0. Otherwise candidates rounded to the nearest whole number giving answers of 606 and 606.0.				
		Total	1					
24		B with three correct figures which can be compared	3	M2 for two correct figures which can be compared or M1 for a correct attempt to make at least two figures comparable	Examiner's Comments The most common calculation for this question was to divide the larger value by the smaller value often resulting in students putting C as their answer. Others divided the smaller by the larger value and more frequently gained full marks. Many scored 2 marks as they produced relevant calculations but clearly did not understand the significance of the figures and opted for the wrong recipe. A large number simply subtracted the quantity of pineapple from the total and gave the answer as the one with the highest value. Whichever method was attempted there was a attempted there was a tendency to write down the biggest number as the answer. A few made fractions out of the numbers but didn't convert to decimals or obtain a common denominator in order to be able to facilitate a comparison. Many just had a guess and put A, B, C as the answer with no working at all. Presentation for this question was generally good with candidates separating the working so that it was logical and relatively easy to follow.			
		Total	3					
25		5 tuna <b>and</b> cheese and one other flavour totalling 5 where the number of cheese is 3, 2 or 1 and is greater than the number of chicken	3	B1 for 5 tuna B1 for number of cheese is greater than the number of chicken and the cheese is either 3, 2 or 1 Examiner's Comments Involved some simple problem solving; a good number were successful in giving one of the correct solutions. Most others were able to identify that there were 5 tuna sandwiches left from the condition that choosing a tuna sandwich was even, many were unable to give more cheese sandwiches left than chicken. A few gave an answer such as 4 cheese, where there were more cheese sandwiches left than there were at the start of the day.	Condone e.g. Tuna 5/10, Cheese 3/10, chicken 2/10 for 3 marks or B marks eg For 2 marks 5 tuna 3 cheese 1 chicken eg For 1 mark 3 tuna 3 cheese 4 ham			
		Total	3					