Countdown to your final Maths exam ... part 11 (2018)

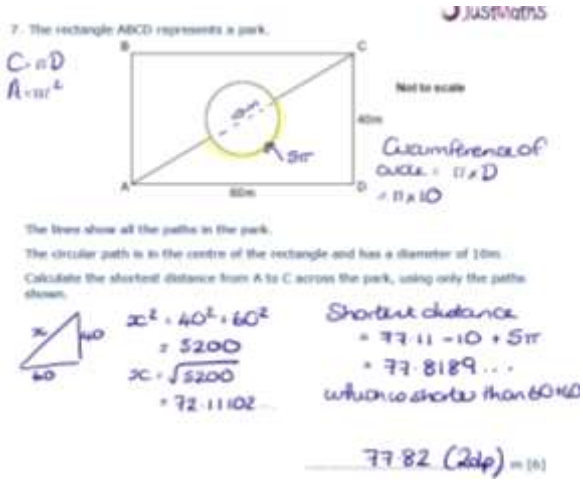
Examiners Report & Markscheme

(It is important to note that some of the scale drawing answers shown in the markscheme may be different to your answers as the questions may be a different size to the original ones!)

Mark Scheme

Q1. None available

Q2.

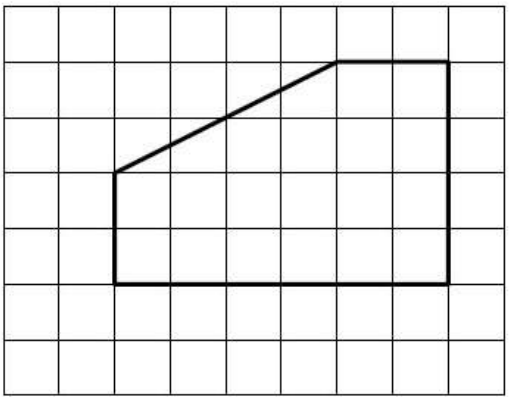


Q3.

PAPER: 1MA0_1H					
Question		Working	Answer	Mark	Notes
			construction	2	M1 for a pair of arcs or a single arc, centre C, that cut line AB **and** at least one pair of arcs not at C within guidelines A1 for perpendicular within guidelines with appropriate construction arcs **OR** M1 for an arc, centre A radius AC **and** an arc centre B radius BC. The two arcs must intersect below AB A1 for perpendicular within guidelines with appropriate construction arcs (SC If M0 scored, B1 for correct perpendicular line within guidelines)

Q4.

		Working	Answer	Mark	Notes
			Correct elevation	2	M1 for a side elevation which shows 2 vertical, 2 horizontal and 1 sloping line in the correct order. A1 fully correct



Q5.

		Working	Answer	Mark	Notes
			25.1-25.2	2	M1 for 2 × 3.142 × 4 or 8π oe A1 for 25.1 – 25. 2

Q6.

5MB3H/01 June 2015				
Question	**Working**	**Answer**	**Mark**	**Notes**
		29.6	4	M1 for $8^2 + 5^2$ or 64 + 25 or 89 M1 (dep) $\sqrt{"8^2"+"5^2"}$ (=9.4) M1 for "9.4..." × π A1 for 29.5 – 29.65

Q7.

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
	(a)		40	3	M1 for $32^2 + 24^2$ M1 for $\sqrt{1600}$ or $\sqrt{(32^2 + 24^2)}$ A1 cao
	(b)		22.72	4	M1 for use of π × 60 oe M1 for method to calculate perimeter of triangle, eg 2 × '40' + 48 (=128) M1(dep M2) for complete method to find total length of strip for both mirrors or to find the cost of strip for one mirror, eg 2 × £5.68 A1 for £22.72 from correct working

Q8.

PAPER: 1MA0_2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
*		No supported by working	4	M1 for π × 7 (= 21.9 to 22) or π × 7 × 2.54 = (55.5 to 56) M1 (dep) for a complete method that could lead to two figures that are comparable eg π × 7 × 2.54; π × 7 and 50 ÷ 2.54 A1 for correct comparable figures eg 55.5 to 56 (cm); 21.9 to 22 (in) and 19.6 to 19.7 (in) C1 (dep M2) for a correct conclusion based on their comparable figures OR M1 for eg 50 ÷ π (= 15.9 to 15.92) or 50 ÷ 2.54π (=6.26 to 6.27) M1 (dep) for a complete method that could lead to two figures that are comparable eg (50 ÷ π) ÷ 2.54; 50 ÷ π and 7 × 2.54 A1 for correct comparable figures eg 6.26 to 6.27 (in); 15.9 to 15.92 (cm) and 17.7 to 17.8 (cm) C1 (dep M2) for a correct conclusion based on their comparable figures

Q9.

Paper: 5MB3H_01					
Question		Working	Answer	Mark	Notes
			shaded region	3	B1 for arc of circle centre *A* radius 2 cm B1 for arc of circle centre *B* radius 4 cm B1 ft for correct region shaded

Q10.

5MB3H_01 November 2015					
Question		Working	Answer	Mark	Notes
			bisector	2	M1 for an appropriate pair of arcs or correct line drawn without construction arcs A1 for perpendicular bisector of *AB* drawn with a pair of construction arcs

Q11.

PAPER: 5MB3H_01					
Question		Working	Answer	Mark	Notes
			43	3	M1 for $\pi \times 40$ or $2 \times \pi \times 20$ M1 for $34 \times 2 \times \pi \times 20$ A1 for 42.7 – 43

Q12.

PAPER: 1MA0_1H					
Question		Working	Answer	Mark	Notes
			Correct region	3	B1 for full line drawn 1.5 cm from edge of patio and parallel to it B1 for full arc of circle radius 3 cm centre the centre of the pond B1 ft for shading region to the right of their vertical line **and** outside the arc of their circle with correct centre

Q13.

Question	Working	Answer	Mark	Notes
*		No (supported)	5	M1 for $\pi \times 9 \div 2$ (=14.137…) or $\pi \times 5 \div 2$ (=7.85…) or for $\pi \times 9$ (=28.27…) or $\pi \times 5$ (=15.7…) M1 for complete method to work out perimeter eg $2 + 2 + (\pi \times 9 \div 2) +$ $(\pi \times 5 \div 2)$ (= 25.99...) M1 (dep M1) for method to find number of rolls required for their perimeter, eg "their total perimeter" ÷ 2.4 eg 25.99..÷2.4 (=10.8), "47.97.."÷2.4 (=19.9) or "43.47.." ÷2.4 (=18.3) M1 for method to work out cost eg 3×10 + 2×3.99 (= 37.98) or 11 × 3.99 (=43.89), 20 →67.98, 19→63.00 or for method to find how many rolls can be bought for £35 (= 10) C1 for a conclusion supported by fully correct answers eg 37.98 (for comparing with 35) e.g 10.8 and 10 OR M1 for $\pi \times 9 \div 2$ (=14.137…) or $\pi \times 5 \div 2$ (=7.85…) or for $\pi \times 9$ (=28.27…) or $\pi \times 5$ (=15.7…) M1 for complete method to work out perimeter eg $2 + 2 + (\pi \times 9 \div 2) +$ $(\pi \times 5 \div 2)$ (= 25.99...) M1 for a method to find how many rolls can be bought for £35 (=10) M1 for a method to work out the coverage of 10 rolls e.g. 10 × 2.4 (=24) C1 for a conclusion supported by fully correct answers eg 25.9(...) and 24

Q14.

		Working	Answer	Mark	Notes
			6.87	4	M1 for $\pi \times 4 \times 4$ or $\pi \times 4^2$ or $\pi \times 16$ or $\pi r^2 = 50.26...$ M1 for 'πr^2' ÷ 2 M1 for $8 \times 4 -$ '$\pi r^2 \div 2$' A1 for 6.86 – 6.88

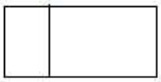
Q15.

Question		Working	Answer	Mark	Notes
*			Conclusion (supported)	4	M1 for $\pi \times 120^2$ (= 45 216 – 45 249) M1 for "$\pi \times 120^2$" ÷ 1800 A1 for 25.1 – 25.2 C1 ft (dep on M2) for appropriate conclusion from their figures OR M1 for $\pi \times 120^2$ (= 45 216 – 45 249) M1 for 20 × 1800 A1 for 36 000 and 45 216 – 45 249 C1 ft (dep on M2) for appropriate conclusion from their figures OR M1 for $\pi \times 120^2$ (= 45 216 – 45 249) M1 for "$\pi \times 120^2$" ÷ 20 A1 for 2260 – 2263 C1 ft (dep on M2) for appropriate conclusion from their figures OR M1 for 1800 × 20 M1 for 36000 ÷ π (=11 457 – 11465) A1 for 107(.0…) C1 ft (dep on M2) for appropriate conclusion from their figures

Q16.

PAPER: 5MB3F_01					
Question		Working	Answer	Mark	Notes
	(a)			2	B2 for correct full size plan (B1 for square with 6cm side length or complete plan not full size)
	(b)		Correct diagram	3	M1 for one correct side length (tolerance ± 2mm) M1 for another correct side length (tolerance ± 2mm) A1 for fully correct diagram SC: B1 for a fully correct sloping face in a 3D sketch

Q17.

5MB2H November 2016					
Question	Working	Answer	Mark	Notes	Type
		Plan 	2	M1 for 7 × 4 rectangle A1 for correct plan with dividing line	G

Q18.

Question		Working	Answer	Mark	Notes
	(a)		Angle drawn	1	B1 cao
	(b)		Triangle drawn	2	M1 intersecting arcs of radii 6 cm or an accurate triangle with no arcs A1 for a fully correct triangle with arcs

Examiner's Report

Q1. None available

Q2. None available

Q3. This question was not done well. Few students could construct the perpendicular from the given point to the line. When drawing the arcs at point *C* centre *A* and centre *B*, students should be advised to draw arcs below the line as well as at point *C*. It was evident that a significant number of students did not use compasses to draw their construction arcs. A common incorrect answer was to draw the perpendicular bisector of the line *AB*.

Q4. This question was well answered. The majority of candidates were awarded both marks. A further few candidates scored one mark for a convincing attempt at the correct side elevation. This was given where errors consisted of lengthening or shortening some of the sides but where the shape had two vertical lines, two horizontal lines and one sloping line in the correct order. A minority of candidates attempted to sketch a three-dimensional representation of the prism. Examiners were unable to award these candidates any marks.

Q5. It is disappointing to see that a large number of candidates chose to use the wrong formula, in this case the area of a circle formula, attracting no marks. There were some who lost marks by using the diameter and others who gave a rounded (inaccurate) answer without showing any supportive evidence of working.

Q6. This question was well attempted and blank responses were rare. Despite the circle most candidates realised that Pythagoras was needed to find the diameter and then went on to find the circumference though a few stopped after finding the diameter forgetting that the question required them to find the circumference. Students were confusing circle formulae and some were finding the area or misremembering the formula completely. The small number of students lost one mark due to premature rounding of their value for the diameter. Only the very weakest students were failing to score any marks usually due to not using Pythagoras at all.

Q7. Candidates understood they had to find the missing side *AB* in this right angled triangle but often just added the two sides of 32 and 24. Only about a third of candidates realised they had to square and add the lengths if the right angled triangle with many subtracting instead. In part (b) a lot of the candidates assumed they had to find the areas of the two mirrors rather than find the perimeter of the mirrors and so scored no marks. Very few candidates were able to give a fully correct solution to this question though partial credit was often earned for trying to find the circumference of the circle and the perimeter of the triangle. Those who did try to find the perimeter did not take account of the fact that the metal strip is sold in lengths of one metre when trying to find the cost. Most candidates did not associate part (a) with part (b).

Q8. This question was well done with the great majority of students finding the circumference of the cake in cm and reaching a correct conclusion, ie that the length of ribbon was not long enough. A relatively small minority of students used an alternative, yet correct approach, for example by working in inches and converting the 50 cm to inches. Almost all students worked accurately, using the value of π from their calculator and clearly communicated their decision at the end of their working. A small proportion of students used the formula for the area of a circle or restricted their working to changing 7 inches to cm or 50 cm to inches and so gained no credit for their responses.

Q9. This question was answered very well indeed with most students gaining full marks. The majority of students appeared to have compasses which they were able to use well to produce an accurate diagram.

Q10. There were many correct lines drawn. Some presented an incomplete construction by using only one pair of construction arcs with a measured point on the line.

Q11.A fully correct response to this question was not often seen. Many students either did not involve a formula for the circumference of the trundle wheel in their answers or they mistakenly used the formula for the area of a circle. Some students were awarded a mark for using the correct formula but did not consider the number of times the wheel rotated. Answers were not always changed to metres.

Q12. Very many candidates were able to get full marks on this question. Many others were able to score at least 1 mark – either by a suitable straight line at the right distance from the given shaded region or from the arc of a circle drawn correctly. Some candidates lost a mark because they did not draw a complete arc that met the rectangle.

Q13. There are two sensible strategies to answer this question, both of which involve calculating the perimeter of the lawn. Then the number of rolls required to cover this perimeter can be found followed by their total cost. Alternatively, the coverage that can be bought for £35 can be calculated and compared to the perimeter. The first of these strategies was more common than the second. Many students were able to use the expression $\pi \times d$ in some form, with d as 9 or 5. However, some did not halve their answers to get the arc lengths of the semicircles. Other students did do this but when attempting to work out the perimeter of the lawn failed to add the 2 m straight lengths. Many students did score further marks by dividing their perimeter by the length of one roll (2.4 m) followed by working out a total cost for their number of rolls. However, some students thought when calculating the cost they either had to use the £3.99 per roll or the 3 for £10; they could not mix the two prices, therefore did

not calculate the cheapest way.

Q14. A fairly small number of candidates achieved full marks on this question. Candidates often arrived at a correct final answer between 6.86 and 6.88 from an incorrect method. The majority of candidates who arrived at the final answer gave it to three decimal places as opposed to three significant figures, but were not penalised for this.

It was disappointing to note that a number of candidates failed to score. Candidates commonly used the wrong formula for calculating the area of a circle, finding the circumference instead. A small number of candidates were able to find the area of the circle correctly but then failed to halve this, scoring no further marks. This question highlighted many candidates' poor knowledge of formulae associated with circles.

Q15. There were some pleasing answers to this question and an interesting variety of approaches. Most successful candidates worked out the area of the surface of the pond and then compared their answer with the answer to 20 × 1800

Another approach started by finding the area of the surface of the pond and then dividing it by 20 to compare with 1800. Some candidates did not understand the units of area, so trued to work out the area needed for 20 fish by 20 × 3240000. Many candidates did not seem to know how to work out the area of the pond often using 120 × 120 or even 360 × 120. A few used the formula for circumference rather than area.

Q16. Few candidates understood what was required in part (a).
By far the most common answer was to see the net of the shape drawn. Those that knew to draw a 6 cm by 6 cm square lost the final mark as they did not draw in the diagonals of the square for a completely correct plan. Others drew the correct square with one or two triangles as well. Part (b) was done far more successfully with nearly all candidates scoring at least 1 mark for one accurately drawn line. Many others went on to correctly draw the required triangle within the tolerances given.

Q17. It was a surprise to see this plan question cause so many problems. More than 80% of students scored zero, and most of these attempted a 3D drawing rather than a 2D plan.

Q18. Most students were able to draw an angle of 40° in part (a). A small number drew an angle of 140°. In part (b) the majority of students gained at least one mark. Those who used a pair of compasses and drew the appropriate arcs were usually successful. A significant number of students, however, gained only one mark because they failed to show construction arcs and merely drew the required triangle instead of constructing it – some used a vertical line from the centre of the base as a guide.