Year 10 Mock Practice Paper 2 - Mark Scheme

Q1.

		Working	Answer	Mark	Notes
	(a)		11.5	3	M1 for $13^2 - 6^2$ or 169 – 36 or 133 M1 (dep on M1) for $\sqrt{"13^2 - 6^2"}$ **or** $\sqrt{133}$ A1 for answer in the range 11.5 – 11.6
	(b)		47.2	3	M1 for cos (*RPQ*)=$^{17}/_{25}$oe **OR** sin *PQR* = $^{17}/_{25}$ with *PQR* clearly identified M1 for (*RPQ* =+) $\cos^{-1}$ $^{17}/_{25}$oe **OR** *PQR* = $\sin^{-1}$ $^{17}/_{25}$ with *PQR* clearly identified A1 for answer in the range 47.1 – 47.2 SC : B2 for an answer of 0.823(033...) **or** 52.3(95...) **or** 52.4

Q2.

PAPER: 1MA0_2H					
Question		Working	Answer	Mark	Notes
			1.875×10^8	2	M1 for digits 1875 A1 cao

Q3.

Question	Working	Answer	Mark	Notes
		60	3	M1 for $\frac{16}{80}$ or $\frac{300}{80}$ oe M1 (dep) for $"\frac{16}{80}" \times 300$ or $"\frac{300}{80}" \times 16$ A1 cao

Q4.

Question		Working	Answer	Mark	Notes
	(a)		−1, 0, 1, 2, 3	2	B2 for all 5 correct values; ignore repeats, any order. (−1 for each omission or additional value)
	(b)	$7x - 3x < 4 + 9$ $4x < 13$	$x < 3.25$	2	M1 for a clear intention to use a correct operation to collect x terms or non-x terms in an (in)equality A1 for $x < 3.25$ oe (SC: B1 for 3.25 oe seen if M0 scored)

Q5.

Question	Working	Answer	Mark	Notes
(a)		x^6	1	B1 cao
(b)		$(2y + 1)(y - 3)$	2	M1 for $(2y \pm 1)(y \pm 3)$ or $(2y \pm 3)(y \pm 1)$ A1 cao

Q6.

		Working	Answer	Mark	Notes
		π × 5 × 1.80	28.27	3	M1 for use of π × x (with x = 5 or x = 2.5) **or** 2 × π × x (with x = 5 or x = 2.5) M1 for π × 5 × 1.8(0) **or** 2 × π × 2.5 × 1.8(0) A1 for 28.26 or 28.27 or 28.28 or 28.3(0) or 28.8(0)

Q7.

PAPER: 1MA0/2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
		17.7(014…)	3	B1 for 7.75 or7.85 or 5.15 or 5.25 or 62.5 or 63.5 M1 for $\frac{1}{2} \times 7.75 \times 5.15 \times \sin 62.5$ A1 for 17.7(0140994…)

Q8.

Question		Working	Answer	Mark	Notes
		Rectangle – unshaded triangle $(x + 6)(3x - 5) - ½ \times 2x(3x - 5) = 3x^2 + 18x - 5x - 30 - (3x^2 - 5x) = 3x^2 + 18x - 5x - 30 - 3x^2 + 5x$ QED OR $(x + 6)(3x - 5) - ½ \times 2x(3x - 5) = (x + 6)(3x - 5) - x(3x - 5) = (3x - 5)(x + 6 - x) = 6(3x - 5) = 18x - 30$ QED OR Shaded trapezium + shaded triangle $½(x + 6 - 2x + x + 6)(3x - 5) = 6(3x - 5) = 18x - 30$ QED	Proof	4	M1 for using two lengths to find an area M1(dep) for '$(x + 6)(3x - 5)$' – '½ × $2x(3x - 5)$' M1 for $3x^2 + 18x - 5x - 30$ or $½ \times (6x^2 - 10x)$ or $3x^2 - 5x$ C1 for a correct completion of the proof resulting in $18x - 30$ from fully correct working OR M1 for using two lengths to find an area M1(dep) for '$(x + 6)(3x - 5)$' – '½ × $2x(3x - 5)$' M1 for factorising process with $(3x - 5)$ as the common factor C1 for a correct completion of the proof resulting in $18x - 30$ from fully correct working OR M1 for $x + 6 - 2x$ $(= 6 - x)$ M2 for $½(x + 6 - 2x + x + 6)(3x - 5)$ C1 for a correct completion of the proof resulting in $18x - 30$ from fully correct working

Q9.

PAPER: 5MB3H_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
*	Key ring: $1.6 \times 9 = 14.4$ Purse : $3.2 \times 8 = 25.6$	Key ring £1.60 Purse £3.20	4	M1 for $9x$ or $8 \times 2x$ (where x is the price of a key ring) M1 for equation $9x + 8 \times 2x = 40$ oe A1 for 1.6 and 3.2 C1 (dep on M2) for both "£1.60" and "£3.20" clearly identified for correct items with correct money notation OR M1 for $(8\times2) : 9 (= 16 : 9)$ M1 for $40 \div (16 + 9)$ A1 for 1.6 and 3.2 C1 (dep on M2) for both "£1.60" and "£3.20" clearly identified for correct items with correct money notation OR M2 for trial with attempt to evaluate $9x$ and $8 \times 2x$ with £1 $< x <$ £2 (M1 for trial with attempt to evaluate $9x$ and $8 \times 2x$ with £1 $\leq x \leq$ £4) A1 for 1.6 and 3.2 C1 (dep on M2) for both "£1.60" and "£3.20" clearly identified for correct items with correct money notation [SC: B2 for both £1.60 cao and £3.20 cao clearly identified for correct items with correct money notation if no working shown]

Q10.

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
	(a)		2, –1, 2, 7	2	B2 for all correct (B1 for 2 or 3 correct)
	(b)		Correct graph	2	M1 (dep on at least B1) for at least 6 points from their table plotted correctly A1 cao for fully correct graph
	(c)	$x^2 - 3x - 4 = 0$ $(x - 4)(x + 1) = 0$	–1, 4	2	M1 for line $y = x + 3$ drawn correctly or for reduction to correct 3 term quadratic (=0) and : $(x \pm 1)(x \pm 4)$ or formula using $a = 1$, $b = -3$ and $c = -4$, allow one sign error in the formula, or $\left(x - \frac{3}{2}\right)^2 = 4 + \left(\frac{3}{2}\right)^2$ A1 cao

Q11.

Question		Working	Answer	Mark	Notes
			28.9	3	M2 for $\frac{75}{360} \times 2 \times \pi \times 6$ oe + $\frac{75}{360} \times 2 \times \pi \times 10$ oe (= 7.85... + 13.08... = 20.94..) (M1 for $\frac{75}{360} \times 2 \times \pi \times 6$ oe or $\frac{75}{360} \times 2 \times \pi \times 10$ oe) A1 for 28.9 to 28.95

Q12.

PAPER: 1MA0/2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
*		28°	4	M1 for angle $ABD = 62°$ M1 for angle $BAD = 90°$ C2 for angle $ADB = 28°$ with full, appropriate reasons given angles in the same segment are equal; angles in a semicircle are 90°; angles in a triangle add up to 180° (C1 (dep on relevant M1) for one correct and appropriate reason relating to a circle theorem) OR M1 for angle $AOD = 62° \times 2$ (= 124°) M1 for $(180° - 124°) \div 2$ C2 for angle $ADB = 28°$ with full, appropriate reasons given the angle at the centre of a circle is twice the angle at the circumference; base angles of an isosceles triangle are equal; angles in a triangle add up to 180° (C1 (dep on relevant M1) for one correct and appropriate reason relating to a circle theorem)

Q13.

		Working	Answer	Mark	Notes
	(a)		-2 -1 0 1 2 3 4 **8** 3 0 **-1** **0** 3 **8**	2	B2 for 8, -1, 0, 8 (B1 for at least two of 8, -1, 0, 8)
	(b)		Correct curve	2	M1 (ft) for at least 5 points plotted correctly A1 for a fully correct curve
	(c)	$x^2 - 2x - 3 = 0$ OR $(x - 3)(x + 1) = 0$	3 and −1	2	M1 for the straight line $y = 3$ drawn to intersect the "graph" from (a) A1 for both solutions **OR** M1 for identifying $y = 3$ from the table A1 for both solutions **OR** M1 for $(x \pm 3)(x \pm 1)$ A1 for both solutions

Q14.

PAPER: 1MA0_2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
	$\frac{232.5}{202.5} \times 60$	68.9	4	M1 for 232.5 or 237.5 or 197.5(=3.29… hours) or 202.5 (= 3.375 hours) M1 for correct conversion of "upper bound of time" from minutes to hours, (202.5 to 205) ÷ 60 M1 for "lower bound of distance" ÷ "upper bound of time" (230 to 232.5) ÷ (3.375 to 3.41(6…)) A1 for 68.8 to 69 from correct working OR M1 for 232.5 or 237.5 or 197.5(=3.29… hours) or 202.5 (= 3.375 hours) M1 for "lower bound of distance" ÷ "upper bound of time" (230 to 232.5) ÷ (202.5 to 205) M1 for correct conversion of "lower bound of speed" from miles per minute to miles per hour, ((1.12(1...) to 1.14(8...)) × 60 A1 for 68.8 to 69 from correct working

Q15.

		Working	Answer	Mark	Notes
			55	4	M1 for a correct method to find a different angle using 35° M1 for setting up a complete process to calculate angle *x* A1 cao B1 states one of the following reasons relating to their chosen method: Alternate angles are equal; Corresponding angles are equal; Allied angles / Co-interior angles add up to 180; the exterior angle of a triangle is equal to the sum of the interior opposite angles.

Q16.

PAPER: 1MA0_2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
		22.5	3	M1 for $\frac{1}{2} \times 7 \times 5 \times \sin 40$ or $\frac{1}{2} \times 7 \times 5 \times \sin(180 - 40)$ M1 (dep M1) for doubling the area of the triangle A1 for 22.4 – 22.5 OR M1 for complete method to find height of parallelogram, eg 5 sin40° M1 (dep M1) for complete method to find the area of the parallelogram, eg 7 × 5sin40° A1 for 22.4 – 22.5

Q17.

Question	Working	Answer	Mark	Notes
		72	4	M1 for "x" + 24 or "x" – 24 or for "g" and 5"g" M1 for forming an appropriate equation eg $x + 24 = 5(x - 24)$ or for $(5g - g) \div 2 = 24$ or $g = 12$ M1 for correct operations to isolate x terms and non-x terms in an equation of the form $ax + b = cx + d$ or $ax + b = c(x + d)$ or $x = 36$ or for 6 × "12" oe A1 cao

Q18.

PAPER: 1MA0_2H					
Question		**Working**	**Answer**	**Mark**	**Notes**
		$AC^2 = 5^2 + 3^2$ $AC = \sqrt{25 + 9}$ (=5.83) $\frac{5}{5.83} = \frac{DB}{3}$ $DB = \frac{5}{5.83} \times 3$ (= 2.57) 5 + 3 + 5.83 + 2.57 = **OR** $AC = \sqrt{25 + 9}$ (=5.83) $\tan A = \frac{3}{5}$ $A = 30.96$ $\sin 30.96 = \frac{DB}{5}$ $DB = 5 \times \sin 30.96$ (= 2.57) 5 + 3 + 5.83 + 2.57 =	16.4	5	M1 for $(AC^2) = 5^2 + 3^2$ =34) M1 for $\sqrt{25 + 9}$ or $\sqrt{34}$ (=5.83) M1 for $\frac{5}{'5.83'} = \frac{DB}{3}$ or $DB \times AC = 5 \times 3$ M1 for $(DB =) \frac{5}{'5.83'} \times 3$ A1 for 16.4 to 16.41 **OR** M1 for $(AC^2) = 5^2 + 3^2$ (=34) M1 for $\sqrt{25 + 9}$ or $\sqrt{34}$ (=5.83) M1 for using a correct trig ratio in an attempt to find angle A or angle C, e.g. $\tan A = \frac{3}{5}$, $\sin A = \frac{3}{'5.83'}$, $\cos C = \frac{3}{'5.83'}$ M1 for using DB in a correct trig ratio, e.g. $\sin '30.96' = \frac{DB}{5}$ A1 for 16.4 to 16.41

Q19.

Question		Working	Answer	Mark	Notes
			3	5	M1 for a complete method to find the area of the cross section, eg. $15 \times 2 + "(12 - 4)" \times 2 + 15 \times 2$ (= 76) or for finding the volume of a relevant prism, eg. $15 \times 2 \times 120$ (= 3600) "(12 – 4)" maybe just seen on the diagram M1 for a method to find the volume of the bar, eg. "76" × 120 (= 9120) or ft "area of cross section"×120 provided "area of cross section" includes a method to find the area of at least **two** relevant rectangles M1 for "volume" × 8, eg. "9120" × 8 (= 72960) or 250 × 1000 ÷ 8 (= 31250) NB "volume" must be dimensionally correct M1 (dep on previous M1) for 250 ÷ ("volume" × 8) ÷ 1000, eg. 250 ÷ "72960 ÷ 1000" (= 3.4265….) or "31250" ÷ "9120" A1 for an answer of 3 with correct working

Q20.

		Working	Answer	Mark	Notes
*		$(n + 1)^2 - n^2$ $= n^2 + 2n + 1 - n^2$ $= 2n + 1$ $(n + 1) + n = 2n + 1$ OR $(n + 1)^2 - n^2$ $= (n + 1 + n)(n + 1 - n)$ $= (2n + 1)(1) = 2n + 1$ $(n + 1) + n = 2n + 1$ OR $n^2 - (n + 1)^2 = n^2 - (n^2 + 2n + 1) =$ $-2n - 1 = -(2n + 1)$ Difference is $2n + 1$ $(n + 1) + n = 2n + 1$	proof	4	M1 for any two consecutive integers expressed algebraically eg n and n +1 M1(dep on M1) for the difference between the squares of 'two consecutive integers' expressed algebraically eg $(n + 1)^2 - n^2$ A1 for correct expansion and simplification of difference of squares, eg $2n + 1$ C1 (dep on M2A1) for showing statement is correct, eg $n + n + 1 = 2n + 1$ and $(n + 1)^2 - n^2 = 2n + 1$ from correct supporting algebra