Year 10 Mock Practice Paper 1 - Mark Scheme

Q1.

Q	Working	Answer	Mark	Notes
	$(-2,-4)(-1,-1)(0,2)(1,5)(2,8)$ $(3,11)(4,14)$	Correct line between $x=-2$ and $x=4$	4	B4 For a correct line between $x=-2$ and $x=4$ B3 For a correct line through at least 3 of $(-2,-4)(-1,-1)(0,2)$ $(1,5)(2,8)(3,11)(4,14)$ **OR** for all of $(-2,-4)(-1,-1)(0,2)$ $(1,5)(2,8)(3,11)(4,14)$ plotted but not joined B2 For at least 2 correct points plotted **OR** for a line drawn with a positive gradient through (0, 2) and a clear attempt to use a gradient of 3 B1 For at least 2 correct points stated (may be in a table) **OR** For a line drawn with a positive gradient through (0, 2) **OR** for a line with the correct gradient. **NB** a line joining (0, 2) to (3, 0) scores B0
				Total 4 marks

Q2.

Question	Working	Answer	Mark	Notes
(a)		40, 60, 20	2	B2 Award B1 for any one correct. Allow standard form, but not trailing zeros (40.0/40.00 etc)
(b)	$\frac{"40"+"60"}{"20"}=\frac{100}{20}$		2	M1 For adding their 40 and 60 correctly (not 42.37 and 58.92) or for correct working with rounded figures.
		5		A1cao dep on M mark awarded above.
				Total 4 marks

Q3.

Radius $= \frac{16}{2} = 8$ M1

Area = $\frac{1}{4}\pi \times 8^2 = 16\pi$ A1

Q4.

Question	Working	Answer	Mark	Notes
	$a^2 + a\sqrt{b} + a\sqrt{b} + b$ **or** $a^2 + a\sqrt{b} + a\sqrt{b} + \left(\sqrt{b}\right)^2$			M1 Correct expansion
		6		A1 For a
		13	3	A1 For b
				Total 3 marks

Q5.

Q		Working	Answer	Mark	Notes	
	(a)		22 000 000	1	B1	
	(b)		9.5×10^5	1	B1	
						Total 2 marks

Q6.

Question	Working	Answer	Mark	Notes
(a)				M1 for $3n + k$ (k may be zero) oe
		$3n + 1$ oe	2	A1 need not be simplified eg. $4 + 3(n-1)$ NB: $n = 3n + 1$ gains M1 A0
(b)	$3n + 1 = 88$ **or** $(88 - 1) \div 3$			M1 ft "$3n + 1$" $=88$ NB. Only ft if their expression is of the form $an + b$ where $a > 1$ and $b \neq 0$
		29	2	A1 ft NB. unrounded answer must be an integer
				Total 4 marks

Q7.

Question	Working	Answer	Mark	Notes
(a)		10	1	B1 Accept $\frac{1}{6}$ hour if units stated.
(b)	$1 \div 0.25$ oe	4	M1 2 A1	Accept $1 \div 15$
(c)	Line at 1.5 km from 0930 to 0940 Line from 1.5 km at 0940 to 0 km at 1010	correct line correct line	B1 2 B1	Accept line from 1.5 km at 09 30 to 0 km at 10 00
				Total 5 marks

Q8.

Question	Working	Answer	Mark	Notes
(a)	Correct factor tree or repeated division to find factors 2, 2, 2, 3, 5, 5 (condone inclusion of 1's)	$2^3 \times 3 \times 5^2$	3	M2 for finding correct factors (condone the inclusion of 1) M1 for finding a set of factors (with a product of 600) which includes at least 3 of the six prime factors. This may be a factor tree that is incomplete or only correct to this stage, for instance. A1 dep on M2
(b)	Eg $\frac{5^{12}}{5^3}$ or $\frac{5^{10}}{5}$ or $\frac{5^{11}}{5^2}$	5^9	2	M1 For a correct application of an index law. A1
				Total 5 marks

Q9.

Question Number	Working	Answer	Mark	Notes
	$\angle OAP = 90°$ or $\angle AOB = 64°$		3	B1 May be implied by second B1 — May be stated or marked on diagram
	$\angle OAB = 58°$ or $\angle OBA = 58°$			B1 — May be stated or marked on diagram
		122		B1 Award full marks for a correct answer
				Total 3 marks

Q10.

Ques		Working		Answer	Mark	Notes	
	a	8000:50 or 50:8000 or $\frac{8000}{50}$ oe		160	2	M1 A1	
	b	$\frac{72}{80} \times 50$ oe	72 × 100 ÷ '160'	45	2	M1	A correct method to find the length of the model, ft their answer to (a)
						A1	cao (If ans 1.6 in (a) then **do not** award marks for 72 ÷ 1.6 = 45)
							Total 4 marks

Q11.

Question	Working	Answer	Mark	Notes		
	64 x 4 (=256) 70 x 5 (=350) "350" – "256"	94 or 94% or 94 / 100 or 94 out of 100	4	M1 M1 M1 dep on M2 A1	0.64 × 400 (= 256) 0.7 × 500 (= 350) "350" – "256"	0.64 × 4 (= 2.56) 0.7 × 5 (= 3.5) (3.5 - 2.56) × 100
				NB: 94 embedded in working but not on answer line gets M3A0 unless contradicted.		
	Alternative (i): List of 4 numbers adding to 256 List of 5 numbers adding to 350 list of 5 is identical to list of 4 but also contains 94 eg 94,50,50,56,100 and 50,50,56,100	94 or 94% etc (as above)		M1 M1 M1 dep on M2 A1 permitted answers as listed for A1 above		
	Alternative (ii): 70 – 64 (=6) (70 – 64) X 4 (=24) 70 + 24	94 or 94% etc (as above)		M1 M1 M1 dep on M2 A1 permitted answers as listed for A1 above		
						Total 4 marks

Q12.

Question	Working	Answer	Mark	Notes	
	$160 - 3x + 7x - 20 = 180$ or $2(160 - 3x) + 2(7x - 20) = 360$ oe	10	3	M1	For a correct equation
	e.g. $4x = 180 - 140$ or $-3x + 7x = 180 + 20 - 160$ or $4x = 40$ or $14x - 6x = 360 - 320 + 40$ oe			M1	For isolating the terms in x in a correct equation
				A1	Dep on at least M1
					Total 3 marks

Q13.

Question Number	Working	Answer	Mark	Notes
(a)		$x=3, y=2$	1	B1 cao
(b)	**Use of gradient and** $y=mx+c$ or clear attempt to use $\frac{\text{vertical difference}}{\text{horizontal difference}}$ eg $\frac{2}{3}$ oe (ignore omission of − sign) **or** for $3y=12-2x$ **or** $3y=-2x+12$ **or** for $y=\frac{12-2x}{3}$ oe **or** gradient $=\frac{2}{3}$ stated or used		4	M1 Throughout question accept $\frac{2}{3}$ written as a decimal rounded or truncated to 2 or more decimal places
	(grad =) $-\frac{2}{3}$ oe or $y=4-\frac{2}{3}x$ oe			A1
	$y=-\frac{2}{3}x+c$ **or** for $y="-\frac{2}{3}"x+c$ where $c\neq 10$ **or** $-\frac{2}{3}x+10$, $"-\frac{2}{3}"x+10$, L$=-\frac{2}{3}x+10$ etc			M1 ft from $"-\frac{2}{3}"$

	$y=-\frac{2}{3}x+10$ oe **or** $2x+3y=30$ oe **or** $y=\text{"}-\frac{2}{3}\text{"}x+10$ oe			A1	ft from "$-\frac{2}{3}$"
(b)	**Alternative scheme:** **Use of** $2x+3y=k$ $2x+3y=k$		4	M1	
	$2\times 0 + 3\times 10$ $(=k)$			M1	Substitution of (0, 10) into $2x+3y=k$
	k = 30			A1	
		$2x+3y=30$ oe		A1	
(c)	(1,1) (1,2) (1,3) (2,2) marked	2		B2	B1 for 3 correct points marked and none wrong **or** for all correct points and either one or more of points on y axis ie. (0,−1) (0,0) (0,1) (0,2) (0,3) (0,4) points on $y=x-1$ ie (0,−1) (1,0) (2,1) (3,2)
					Total 7 marks

Q14.

Q	Working	Answer	Mark	Notes
i	e.g. $\frac{1}{2}\times(x+6+3x-4)\times(x-1)$ **or** $(x+6)(x-1)$ **or** $(x-1)(3x-4)$ **or** $\frac{1}{2}\times(x-1)(3x-4-(x+6))$		6	M1 correct algebraic expression for any relevant area
	eg. $\frac{1}{2}\times(4x^2-2x-2)=119$			M1 for correct equation with at least one pair of brackets expanded correctly
		shown		A1 for completion to given equation
ii	$(2x\pm15)(x\pm8)$ (=0) **or** $\frac{--1\pm\sqrt{(-1)^2-4\times2\times-120}}{2\times2}$ **or** $\left(x-\frac{1}{4}\right)^2-\left(\frac{1}{4}\right)^2-60=0$			M1 Start to solve quadratic condone one sign error in substitution if quadratic formula used; allow -1^2 or 1^2 or 1 in place of $(-1)^2$ ft from an incorrect 3 term quadratic equation
	$(2x+15)(x-8)$ (=0) **or** $\frac{1\pm\sqrt{1+960}}{4}$ **or** $x=\frac{1}{4}\pm\sqrt{\left(\frac{1}{4}\right)^2+60}$ **or** -7.5 **and** 8 given as solutions			M1 dep ft method from an incorrect 3 term quadratic equation
		8		A1 Award all 3 marks if first M1 awarded **and** 8 alone given as final answer
				Total 6 marks

Q15.

Question	Working	Answer	Mark	Notes
	$x = 0.1777....$ and $10x = 1.777..$ $9x = 1.6$	16/90 oe		See at least 3 sevens or recurring symbol. Condone omission of x. M1 Accept $10x = 1.777..$ and $100x = 17.77..$ A1 Must be integers in numerator and denominator but not 8 & 45 N.B for $0.1777 = 1/10 + 0.0777..$ (0.777 needs to be shown to be 7/90 to gain first M1)
				Total 2 marks

Q16.

The correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Question	Working	Answer	Mark	Notes
(a)		$(a-b)(a+b)$	1	B1 oe
(b)	$(2^{11}-1)(2^{11}+1)$ **or** $(2048-1)(2048+1)$ **or** $\sqrt{4194304} = 2048$ **or** $\sqrt{2^{22}} = 2048$ **or** $\sqrt{2^{22}} = 2^{11}$ **or** $\sqrt{4194304} = 2^{11}$ **or** 3 , 23 , 89 , 683 (may be seen in a factor tree)		2	M1
		2047, 2049		A1 cao
				Total 3 marks

Q17.

Question	Working	Answer	Mark	Notes
	$y^2 = ay^2 + n$		5	M1
	$y^2 - ay^2 = n$ **or** $1 = a + \frac{n}{y^2}$ **or** $1 - a = \frac{n}{y^2}$			M1 isolate terms in y^2 or divide through by y^2
	$y^2(1-a) = n$			M1 take out y^2 as a common factor
	$y^2 = \frac{n}{1-a}$			M1 y^2 as subject
		$\sqrt{\frac{n}{1-a}}$		A1 accept $\sqrt{\frac{-n}{a-1}}$
				Total 5 marks

Q18.

Question	Working	Answer	Mark	Notes
(a)		$x/60$ oe	1	B1 Must be a fraction or 0.016 rec x
(b) (i)	$2(\text{"}x/60\text{"}) = (x+20)/80$ $16(0)\ x = 6(0)(x + 20)$ or $80\ x = 30(x + 20)$ or $2x/3 = (x + 20)/4$		3	M2 (must be an equation) M1 for either $2(\text{"}x/60\text{"})$ or $(x+20)/80$ A1 dep Correct removal of denominators. Correct removal of denominators. Simplifying denominators.
(ii)	$8x = 3x + 60$ or $5x = 60$ or $60 \div 5$	12	2	M1 A1 Dependent on M1. Can be marked if seen in b(i)
				Total 6 marks

Q19.

Q	Working	Answer	Mark	Notes
(a)	$2 \times 3\ x \times x = (x + 10)(3x + 20)$ or $6x^2 = (x + 10)(3x + 20)$ $6x^2 = 3x^2 + 50x + 200$		3	M2 If not M2 then M1 for $2 \times 3x \times x$ or $2 \times 3x^2$ or $6x^2$ or $(x + 10)(3x + 20)$ A1 Dependent on at least M1
(b)	$(3x + 10)(x - 20) (=0)$ Marks can be awarded in b) if seen in a) 20 x 3 x 20	$x = 20$ 1200	5	M2 or $x = \frac{50 \pm \sqrt{2500 + 2400}}{6}$ If not M2 then M1 for $(3x \pm 10)(x \pm 20)$ or $x = \frac{-(-50) \pm \sqrt{(-50)^2 - 4 \times 3 \times -200}}{2 \times 3}$ condone 1 sign error A1 dep on M1 in b). Ignore negative root (– 3.3 rec) M1 A1 dep on 1st M1 in b)
				Total 8 marks