Gold Level

Mark Scheme 2

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Difficulty Level	Gold
Booklet	Mark Scheme 2

Time Allowed: **58 minutes**

Score: **/48**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	65%	55%	45%	35%	25%	15%	<15%

Question Number	Working	Answer	Mark	Notes
1. (a)	$\frac{(600+5x)-50x}{50x}$ x 100 = x oe 100(600 +5x − 50x)= 50x^2 oe 2(600–45x)=x^2 oe (but not ans)	50x x [1 + $\frac{x}{100}$] = 600 + 5x oe 5000x + 50x^2 = 60000 +500x x^2 = 1200 – 90x	3	M1 $\frac{actual\ profit}{original}$ x 100 = x ($\frac{(600+5x)}{50x}$ −1) x 100 = x oe M1 dep (removing denominator) (600 +5x – 50x) x 100 = 50x^2 A1 reducing to 1x^2 dep on M2 1200 − 90x = x^2
(b)	$x=\frac{-90\pm\sqrt{90^2-4x1x-1200}}{2}$ $x=\frac{-90\pm\sqrt{8100+4800}}{2}$	11.789……	3	M1 condone 1 sign error {working can be seen in part a)} sign error = +90 instead of – 90 or +1200 instead of –1200 M1 A1 dep on M2 awrt 11.8 (ignore negative root).
				Total 6 marks

2. (a)	(AC^2 =) $5^2 + 7^2$ (=74) (AG^2 =) "74" + 3^2 (=83) (AG =) √"83"	9.11	3	M1 or AC = 8.6.. or (BG^2)= $3^2 + 7^2$ (=58) or (AF^2)= $3^3 + 5^2$ (AG^2 =) "58" + 5^2 (=83) M1 ft (dep on M1) M1M1 for √($5^2 + 7^2 + 3^2$) A1 awrt 9.11
(b)	sin θ = 3/ √"83"	19.2	2	M1 or cos θ = √"74"/ √"83" or tan θ = 3 / √"74" or cos θ = $\frac{"74"+"83"-9}{2\ x\ \sqrt{"74"}x\ \sqrt{"83"}}$ A1 awrt 19.2 or 160.8
				Total 5 marks

3.	$\sqrt{(8 \times 6)} + \sqrt{(18 \times 6)}$ $(2\sqrt{2} \times \sqrt{6}) + (3\sqrt{2} \times \sqrt{6})$	must see intention to add $(k=)\ \sqrt{50}$ or $5\sqrt{2}$ or $\frac{10}{\sqrt{2}}$	M1 M1 A1	or $\sqrt{(16 \times 3)} + \sqrt{(36 \times 3)}$ $(= 10\sqrt{3})$ $10\sqrt{3} \times \frac{\sqrt{2}}{\sqrt{2}}$ or $\frac{10\sqrt{3}}{\sqrt{6}}$ dep on at least 1 M1 sight of decimals *used in working* loses M marks at that stage and A mark	or $\sqrt{(4 \times 12)} + \sqrt{(9 \times 12)}$ $(= 5\sqrt{12})$ $5\sqrt{12} \times \frac{\sqrt{2}}{\sqrt{2}}$ or $5 \times \sqrt{(6 \times 2)}$
					Total 3 marks

4. (a) (i)		**4b**	1	B1	4 x b etc Do not accept upper case letters
(a) (ii)		**a** + **b**	1	B1	Do not accept upper case letters
(a) (iii)		3**b** – **a** oe	1	B1	needs not be simplified (e.g –b –a +4b) No upper case
(b)	TS=1/5 (**a**+**b**)+3**b** – **a** QT= – **a**+4/5(**a**+**b**) TS= – 4/5**a** +16/5**b** QT= – 1/5**a**+4/5**b** TS=4/5(– **a**+4**b**) and QT=1/5(– **a** +4**b**)	k=4	3	M1 for any correct route from T to S <u>or</u> from Q to T using capitals or lower case e.g. TS =TR + RS or QT = QP + PT M1 for <u>both</u> correct simplified routes from T to S <u>and</u> Q to T (must be lower case vectors here) A1 dep on B1 in aii) and aiii) and at least M1
					Total 6 marks

5. (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

6. (a)	$y = 36 - x$	(Area =) $x\ (36 - x)$	3	M2 M1 for $x + y = 36$ oe or $2y = 72 - 2x$ A1 Must see x times (36 – x) dep on M2
(b)		$(dA/dx) = 36 - 2x$	2	B1 B1 B1 for 36 B1 for $-2x$
(c)	"$36 - 2x$" = 0 $x = 18$	(Area =) 324	3	M1 allow ft only on $a + bx$ ($a,b \neq 0$) A1ft A1ft
				Total 8 marks

7. (a)	F = " k"/d^2 $12 = k/2^2$ k = 48	$F = 48/d^2$	3	M1 k= letter not number. M1 A1 Award 3 marks for F = " k"/d^2 and k = 48 stated anywhere, unless contradicted by later work.
(b)	(F =) "48"/ 5^2	1.92 oe	1	B1 ft $k \neq 1$ accept 48/25 as an answer.
(c)	$3 =$ "48"/ d^2 $d^2 =$ "48"/3	4	2	$k \neq 1$ M1 Rearrangement to make d^2 or d the subject A1 ignore ±
				Total 6 marks

8. (a)	10 x 3 or 15 x 2 or 12 x 7.5/3	30	2	M1 or any correct fd in correct position and no errors, or 1 sq = 2 (runners) indicated. A1
(b)	Missing blocks = 6cm, 10cm, 2cm		2	B2 3 correct blocks B1 1 or 2 correct blocks
(c)	0.6 x 20 + 0.8 x "30" or 3 x "4" + 8 x "3" or 450 x 0.08	36	2	M1 (partitioning blocks) (time x fd's) {must see clear evidence that fd values used}. 450 small squares. A1 cao
				Total 6 marks

9.	$x = 0.1777....$ 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