Mock Revision (F5 only) [49] MARKSCHEME

1.

(a) (i) $x = 104°$ B1

(ii) $y = 128°$ B1

(b) $115°$ M1,A1

M1 for sight of R or Q = 90
A1 for 360 – 90 – 90 – 65

[4]

2.

9.2(0)	**5** 3 AO1.3b 2 AO3.1b	**M1** for $\frac{6.3}{\sin 33}$ **A1** for 11.567(…) **soi** **M1 dep** *for evidence of cosine rule used **M1** for *their* '11.6'^{2} + 8.4^2 – 2 × *their* '11.6' × 8.4 × cos 52	**rot** to 3 or more sf *Dep on 1st M1 84.7(…) seen implies 4

3.

(a) $a = 3$ B1

$(x-3) = x^2 - 6x + 9$ M1

Or $a^2 + b = 13$ or $3^2 + b = 13$

$b = 4$ A1

(b) 4 *ft from their b* B1 ft

[4]

4.

(a)		$a = 1$ $b = 3$ $c = -9$	**1** **1** **3** 1 AO1.1 1 AO1.3b 1 AO2.1a 2 AO3.1b	**M2** for $b^2 - 4ac = 45$ Or **M1** for $\sqrt{b^2 - 4ac} = 3\sqrt{5}$	
(b)		There will be other values of *a*, *b*, *c* for a quadratic function that will give the same roots	**1** 1 AO3.4b		e.g. there are many parabolas that can be drawn through $(-1.5 - 1.5\sqrt{5}, 0)$ and $(-1.5 + 1.5\sqrt{5}, 0)$

5.

(a) $\frac{8x}{(2x-1)}$ B3

8x(x + 3)
B1
(2x – 1)(x + 3)
B1

(b) $2a = -6$ M1

$a^2 + b = 13$ M1

$a = -3$ and $b = 4$ A1

or $x^2 + 2ax + a^2 + b (= x^2 - 6x + 13)$

[6]

6.

$x^2 + (2x+3)^2 = 2$ M1

$4x^2 + 6x + 6x + 9$ M1

condone one error

$5x^2 + 12x + 7 = 0$ A1

oe

$(x+a)(5x+b) = 0$ M1

ab = 7 or by the formula

$(x+1)(5x+7) = 0$ A1

$x = -1$ or $-\frac{7}{5}$ A1

Alternative

(–1,1) *A1*

$(-\frac{7}{5}, \frac{1}{5})$ *A1*

$y = 1$ or $\frac{1}{5}$ A1

[7]

7.

(a)		$\frac{x^6}{y^3}$	**2** **2 AO1.3a**	**M1** for $\left(\frac{x^2}{y}\right)^3$ or $\frac{x^{12}y^3}{x^6y^6}$
(b)	**(i)**	$\frac{2x}{y}$	**1** **1 AO1.3a**	
	(ii)	$\frac{3x^2+14x}{(x-2)(x+3)}$ or $\frac{x(3x+14)}{(x-2)(x+3)}$ or $\frac{x(3x+14)}{x^2+x-6}$	**3** **3 AO1.3b**	**M1** for numerator $4x(x+3) - x(x-2)$ **oe** **M1** for denominator $(x-2)(x+3)$ **oe**

8.

(a)		$8\sqrt{5}$ final answer	**3** **1 AO1.1** **1 AO1.2** **1 AO1.3a**	**B2** for $2\sqrt{80}$ or $[r=]\ 4\sqrt{5}$ Or **B1** for $\sqrt{80}$ **oe seen**	
(b)		Incorrect as $74 < 80$	**2** **1 AO1.3a** **1 AO2.4a**	**M1** for $5^2 + 7^2$	
(c)		$x^2 + \left(\frac{1}{2}x+10\right)^2 = 80$	**M1**		Allow other complete correct methods
		$\frac{1}{4}x^2 + 10x + 100$	**B1**	Expands bracket correctly	
		$5x^2 + 40x + 80\ [= 0]$ **oe**	**A1**		
		$[5](x+4)^2 = [0]$	**M1**	FT *their* quadratic	Allow other correct methods e.g. complete the square, use of formula
		Repeated **oe** equal roots hence tangent **oe**	**A2** **1 AO1.3b** **2 AO2.2** **3 AO3.1b**	**A1** for $x = -4$ [twice]	

9.

(a) Correct Pythagoras in two appropriate right-angled triangles M1
or simply $BH^2 = 12^2 + 3^2 + 4^2$

13 A1

(b) $HB = 13$, $HC = 5$ or $DB = \sqrt{153}$
with attempt at trig. Ratio M1
Explanations may not involve any calculations
eg BC < BD or HC > HD together with some comparison such as BH is common
(diagrams drawn, to illustrate, are appropriate)

Two correct, comparable trig. ratios

eg $\sin x = \frac{4}{13}$ and $\sin y = \frac{5}{13}$ A1
For example: BH is common and triangles BHD and BHC are right-angled, so y must be bigger because the height is greater

y A1
Good explanation and correct conclusion ... this earns all 3 marks

[5]

10.

8.63 to 8.65	P1	for a start of process, eg. $0.5x(x-2) = 2.5$
	P1	for rearranging to give a quadratic equation, eg $x^2 - 2x - 5 = 0$ oe.
	P1	for a process to solve the quadratic equation, condoning one sign error in use of formula ($x = 3.449...$ and $x = -1.449...$)
	P1	for selecting the positive value of x and applying Pythagoras to find the hypotenuse, eg. $\sqrt{(3.449^2 + 1.449^2)}$ $(= 3.74...)$
	P1	for complete process to find perimeter
	A1	for answer in the range 8.63 to 8.65