

June 2005

Paper 4H Mark  
scheme

Q	Working	Answer	Mark	Notes
1.	Correctly collect $p$ terms in eqn Correctly collect constants in eqn	$\frac{1}{2}$ oe	3 M1 M1 A1	eg $4p + 3 = 5$ (not $7p - 3p + 3 = 5$ )  <b>Total 3 marks</b>
2.	14.9422 $611 - 182 = 429$ "429" $\times$ 0.0704      or 30.2016 "14.9422" + "30.2016"      or 45.1438 "45.1438" $\times$ 5/100      or 2.25719 "45.1438" + "2.25719"	47.40(099)	7 B1 B1 M1 M1 M1 M1 A1	Allow working to 3 s.f. or better throughout M marks can be implied  45.14 $\times$ 1.05 or 47.50 or 2.25 Can be awarded in previous line At least 2 d.p.  <b>Total 7 marks</b>
3. (a)		$50^\circ$	3 B3	If B3 not gained: $PQS = 70^\circ$ / $\angle PTR = 60^\circ$ / ext $\angle PTR = 120^\circ$ : B2 If B2 not gained: $\angle PST = 60^\circ$ : B1
(b)		$\angle$ s on a straight line = $180^\circ$ or $\angle$ sum of triangle = $180^\circ$ or ext $\angle$ of $\Delta$ = sum of int opp $\angle$ s <b>AND</b> Corresponding $\angle$ s or alternate $\angle$ s or allied or supp or included or interior or co-interior $\angle$ s	2 B1  B1	       <b>Total 5 marks</b>

4.	(a)	(i)	$p^4$	1	B1	
		(ii)	$-3a + 4b - 7$	2	B2	B1: 2 terms. subs include
		(iii)	$q^6$	1	B1	working: -B1
	(b)		$2x^2 + 3x$	2	B2	B1 each term. subs include working: -B1
	(c)		$y^2 + 2y - y - 2$	2	M1	3 terms correct or 4 terms correct ignoring sign
			$y^2 + y - 2$		A1	Incorrect subsequent work: -A1
<b>Total 8 marks</b>						
5.	(a)		10-19	1	B1	
	(b)		42/59 or 0.71(...) or 71(...)%	2	B2	B1 num, B1 denom 42:59 B1
	(c)		$8 \times 4.5 + 20 \times 14.5 + 14 \times 24.5 + 5 \times 34.5 + 12 \times 44.5$ Midpoints 4.5 (or 5 or 4) etc	3	M1	$\geq$ four $fx$ attempted, consistent $x$ within interval dep (for midpoints 4 or 5 etc) ISW eg $\div 59$ 23.3, 1405, 1346 (no working): SC B2 22.8, 23.8 : SC B1
			1375(.5) or 1376		M1 A1	
<b>Total 6 marks</b>						
6.			No or not necessarily Some are (or may be) both	2	B1 B1	dep on 2 <sup>nd</sup> B1
<b>Total 2 marks</b>						

7.	(a)	$8^2 + 15^2$ or 289 seen $\sqrt{\quad}$	17cm	3	M1	$\tan x = 15/8$ dep on x used
					M1	dep $8/\cos x$
					A1	Answer rounds to 17.0
	(b)		15/8 or 1.875 or 1.88 seen	1	B1	ISW
<b>Total 4 marks</b>						
8.	(a)		Kitchen chairs	2	B1	Or equivalent. Must be clear that overlap is intended eg "chairs that are part of / common to kitchen furniture" "furniture that is both a chair and in the kitchen"
			belonging to Angela or "her"		B1	
	(b)	(i)	1, 2, 3, 4, 5, 6, 7, 8, 9	2	B2	-B1 each omission or extra Any order, in a single list Ignore negative odd numbers
		(ii)	Yes - no common members	1	B1	Or eg "No odd numbers in P." "P is even numbers, or Q is odd numbers." Must refer to sets or odd or even
<b>Total 5 marks</b>						
9.		$19.8 = 2\pi \times r \times 2.1$ or $19.8 / (2\pi \times 2.1)$	1.5 or better	2	M1A1	Or $19.8 = 2\pi \times 1.5 \times 2.1$
		OR $2\pi \times 19.8 \times 2.1$	261(.3..)		M1A1	
<b>Total 2 marks</b>						

- |         |   |   |                |   |
|---------|---|---|----------------|---|
| 10. (a) | $9.905 \times 10^7$ or 99 050 000 or<br>$9.91 \times 10^7$ or 99 100 000  | 2 | B2             | B1 for digits 9905 or 991                   |
| (b)     | $9.7/100 \times 9.72 \times 10^7$<br><br>$9.43 \times 10^6$ or 9 430 000 or better                                      | 2 | M1<br>A1       |   |
| (c)     | Total = $5.988 \times 10^8$ or 598800000<br>( $4.98 \times 10^8$ / her $5.988 \times 10^8$ ) x 100<br><br>83% or better | 3 | B1<br>M1<br>A1 | Or 599000000<br>dep total clearly attempted |

**Total 7 marks**

- |         |   |   |            |  |
|---------|---|---|------------|--|
| 11. (a) | 3 x (i) or otherwise equalize<br>coeffs<br><br>$\frac{1}{2}, 1$ | 3 | M1<br>A1A1 | Whole equations correct<br>T & I: 3 or 0 |
| (b)     | Her ( $\frac{1}{2}, 1$ )  | 1 | B1f        |  |

**Total 4 marks**

- |         |                                 |   |          |                     |
|---------|---------------------------------|---|----------|---------------------|
| 12. (a) | 49                              | 1 | B1       |                     |
| (b) (i) | $2.5 \times 3/2$ oe<br><br>3.75 | 2 | M1<br>A1 | cao                 |
| (ii)    | $1.5 \times 2/3$ oe<br><br>1    | 2 | M1<br>A1 | Or 1.5 - 0.5<br>cao |

**Total 5 marks**

13. (a)  $2(-4) - 3$  -11 2 M1  
A1
- (b)  $2a - 3 = 5$  or  $(5 + 3)/2$  4 2 M1  
A1
- (c)  $f(2 \times 6 - 3) + 1$  4 2 M1  
A1
- (d) Negative or  $x < 0$  1 B1
- (e)  $y = 1 + \sqrt{x}$  |  $f, +1$  3 M1 Or  $x = 1 + \sqrt{y}$   
 $x = (y - 1)^2$  |  $\text{becomes } -1, ( )^2$  M1  
 $g^{-1} : x \rightarrow (x - 1)^2$  or  $y = (x - 1)^2$  A1 Or  $g^{-1}(x) = (x - 1)^2$  or  $(x - 1)^2$

Total 10 marks

14. (a)  $x(28 - 2x)$  seen 1 B1 Brackets essential
- (b) (i)  $28 - 4x$  2 B1B1 Ignore "y ="
- (ii)  $"28 - 4x" = 0$  2 M1  
 $x = 7$  A1
- (iii) negative coeff. of  $x^2$  or  $\cap$  shape 1 B1 Not "the value is negative."  
or  $\frac{d^2y}{dx^2} = -4$ , which is negative ft her  $28 - 4x$
- (c)  $28 \times 7 - 2 \times 7^2$  98 2 M1 ft his (ii) if working seen  
 A1 cao

Total 8 marks

15. (a)  $\pi \times 12^2 \times 110/360$  2 M1 Or  $\pi \times 12^2 \times 0.31$ ,  
Or  $\pi \times 12^2 \div 3.3$  or better  
A1  
 138(.2. . .)
- (b)  $1/3 \times 2\pi r$  or  $120/360 \times 2\pi r$  seen 3 M1 Or equivalent explanation  
 +  $2r$  seen M1  
 $\frac{2\pi r}{3} + 2r$  or  $2/3\pi r + 2r$  A1

**Total 5 marks**

16. (a) (i)  $-a + b$  oe 1 B1 } Simplification not required  
 (ii)  $2a$  oe 1 B1 } Allow plain  $a, b$   
 (iii)  $-2a + 2b$  oe 1 B1 }
- (b) Parallel 2 B1 (b) marks dep (a)(i)&(iii) correct  
 $QR = 2MN$  B1 Without vector symbols unless  
 or lines in ratio 1:2 or 2:1 "length" stated.

**Total 5 marks**

17. (a) One block of correct height, 4 M1 8cm, 5.6cm or 0.8cm, any  
 or  $20/5$  or  $14/5$  or  $8/20$  seen width  
 Correct blocks, height & width A1A1A1
- (b)  $1/2 \times 14$  or  $1/4 \times 8$  or  $2.5 \times 2.8$  or 2 M1 Value "7" or "2" not enough  
 $5 \times 0.4$  A1
- 9

**Total 6 marks**

18. (a)  $\frac{2}{5}$  and  $\frac{3}{5}$  correctly placed 3 B1  
 $\frac{3}{4}$  and  $\frac{1}{4}$  correctly placed B1 Allow even if extra branches  
 Correct structure includes labels B1

(b)  $\frac{3}{5} \times \frac{3}{4}$  or  $\frac{9}{20}$   
 $+ \frac{2}{5}$

$\frac{17}{20}$  or 0.85 oe

3 M1

M1 dep  
 A1

Total 6 marks

19.  $5.\dot{1}-0.5\dot{1}$  or  $51.\dot{1}-5.\dot{1}$  or  $51.\dot{1}-0.5\dot{1}$

2 M1 Or 1/90 seen

$\frac{23}{45}$  or  $\frac{46}{90}$  or  $\frac{460}{900}$  oe A1

Total 2 marks

TOTAL FOR PAPER: 100 MARKS