

For AQA

General Certificate of Secondary Education

MATHEMATICS

Higher Tier

Paper 1A Non-Calculator

Marking Guide

H

Method marks (M) are awarded for knowing and using a correct method.

Accuracy marks (A) are awarded for correct answers, having used a correct method.

(B) marks are independent of method marks.



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Higher Tier Paper 1A Marking Guide

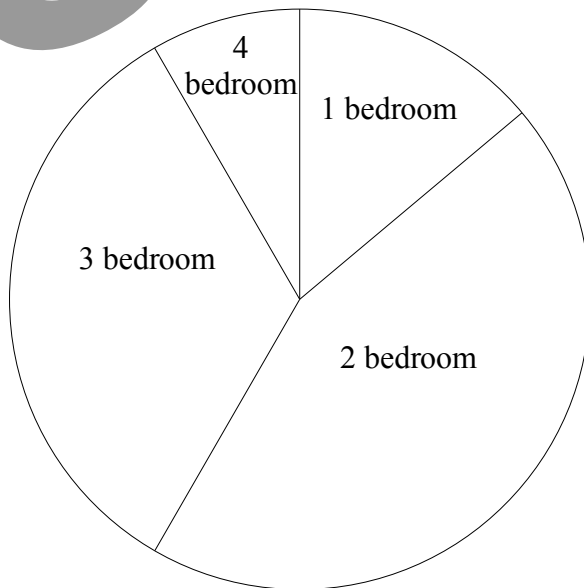
1. $\angle ACB = \angle ABC = 34$ B1
 $\angle BAC = 180 - (34 + 34) = 112$ M1
 $x = 360 - 112 = 248^\circ$ A1 Total 3

2. (a) $\begin{array}{cccc} 56 & 28 & 14 & 7 \\ 2 & 2 & 2 & \\ 56 = 2^3 \times 7 & & & \end{array}$ M1
A1

(b) $\begin{array}{cccc} 84 & 42 & 21 & 7 \\ 2 & 2 & 3 & \\ 84 = 2^2 \times 3 \times 7 & & & \\ \text{HCF} = 2^2 \times 7 = 28 & & & \end{array}$ M1
A1 Total 4

3. $4p + 9 = -3$ M1
 $4p = -12$ M1
 $p = -3$ A1 Total 3

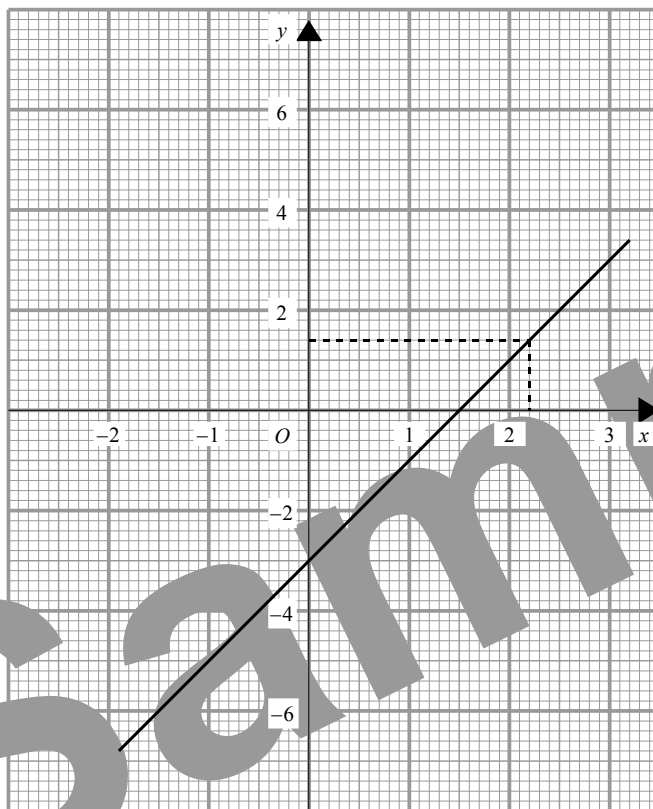
4. $360 \div 720 = \frac{1}{2}$
multiply by $\frac{1}{2}$ to get angles: $50^\circ, 160^\circ, 120^\circ, 30^\circ$ M1 A1



B2

Total 4

5. (a)



B3

(b) $x = 2.2$

B1

Total 4

6. (a) $5 + 6 + 7 = 18$
 $36 \div 18 = 2$
 $6 \times 2 = 12$

M1
M1
A1

(b) 1 hour = 3×20 mins
average speed = $3 \times 5 = 15$ km/h

M1
A1

Total 5

7. (a) $10\% = 28\text{p}$, $5\% = 14\text{p}$, $2\frac{1}{2}\% = 7\text{p}$
VAT = $28\text{p} + 14\text{p} + 7\text{p} = 49\text{p}$
total cost = $\text{£}2.80 + 49\text{p} = \text{£}3.29$

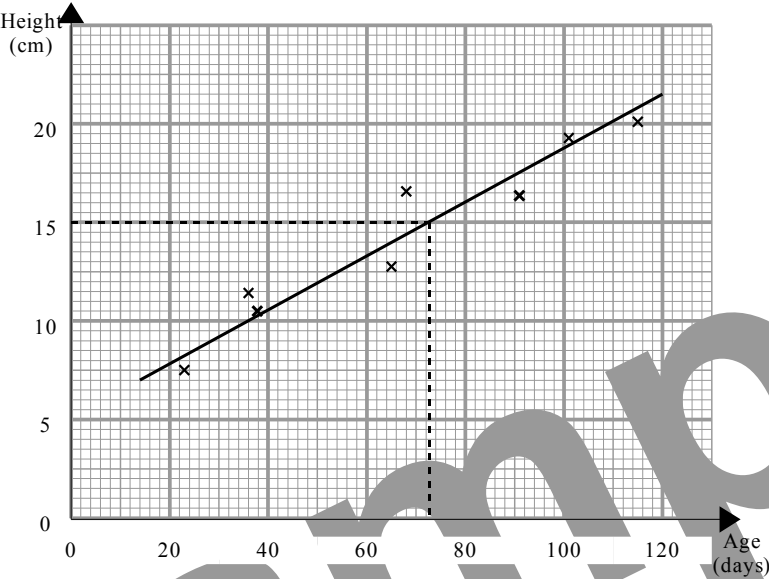
M1
M1
A1

(b) $470 \div 40 = 11.7\dots$
 \therefore should buy 12 boxes

M1
A1

Total 5

8. (a) B1



(b) positive B1

(c) (i) line of best fit M1
 from graph (about 72 days) A1

(ii) 24 cm is outside range of the data B1
 relationship may not be valid

Total 5

9. by alternate angles, $\angle XYS = \angle YXN = 115$ M1

bearing = $180 + 115 = 295^\circ$ A1

Total 2

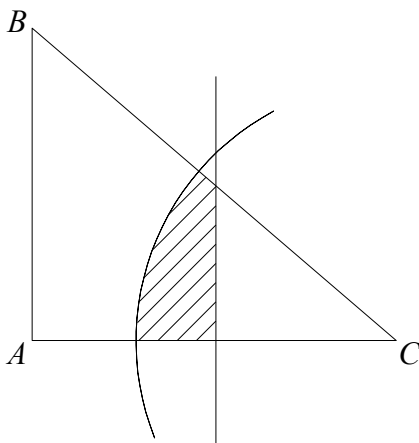
10. $\approx \frac{900 \times 30}{3^2}$ M1

$= 100 \times 30$ M1

$= 3000$ A1

Total 3

11.



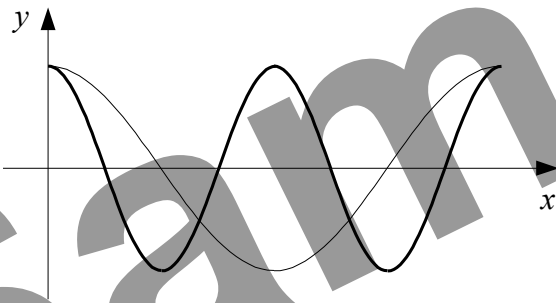
perpendicular bisector of AC M1

arc, centre C, radius 5 cm M1

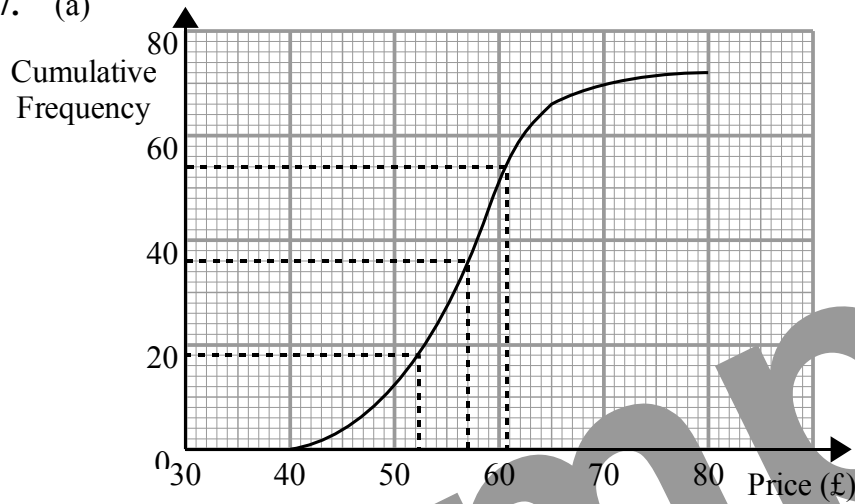
accurate line and arc A1

correct region shaded A1

Total 4

12.	(a) $4a^2$	B1	
	(b) x^4	B1	
	(c) $= (x-4)^2 - 16 + 19$ $= (x-4)^2 + 3$ $a = -4, b = 3$	M1 A1 A1	Total 5
13.	(a) (i) $(90, 0)$	B1	
	(ii) $(180, -1)$	B1	
	(b) 	B2	
			Total 4
14.	(a) area	B1	
	(b) volume	B1	Total 2
15.	$P + l = 2\pi r + 5r$ $P + l = r(2\pi + 5)$ $r = \frac{P + l}{2\pi + 5}$	M1 M1 A1	Total 3
16.	(a) $\frac{1}{3}$	B1	
	(b) $= \frac{18}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$ $= \frac{18\sqrt{3}}{3} = 6\sqrt{3}$	M1 A1	Total 3

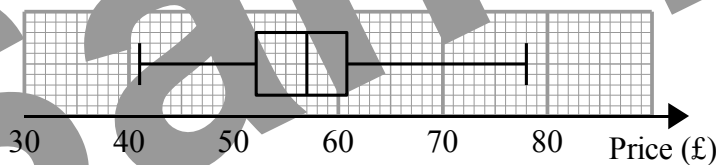
17. (a)



(approx) £57

B1

(b)



M1 A2

Total 4

18. $2(x-1) + 3(x+3) = (x+3)(x-1)$
 $2x-2 + 3x+9 = x^2 + 2x-3$
 $x^2 - 3x - 10 = 0$
 $(x+2)(x-5) = 0$
 $x = -2, 5$

M1 A1

M1

A1

M1

A1

Total 6

19. let smallest number be $2n$ where n is an integer
 next two are $2n+2$ and $2n+4$
 sum is $2n+2n+2+2n+4$
 $= 6n+6 = 6(n+1)$ which is a multiple of 6

M1

M1

A1

Total 3

20. (a) (approx) -1.45 or 2.45

B1

(b) $2x - 2x^2 = 1 \Leftrightarrow 7 + 2x - 2x^2 = 8$
 the curve does not intersect $y = 8 \therefore$ no solutions

M1

A1

Total 3

21. (a) OP is radius and PQ is tangent $\therefore \angle OPQ = 90^\circ$
 $\angle ORP = \angle OPQ$ and $\angle POQ$ is common
 angle sum of triangle $= 180^\circ \therefore \angle OQP = \angle OPR$
 three equal angles \therefore triangles OPR and OPQ are similar

B1

M1

A1

(b) $OQ^2 = OP^2 + PQ^2 = 5^2 + 12^2 = 169$
 $OQ = 13$
 $\frac{OR}{OP} = \frac{OP}{OQ}$
 $\frac{OR}{5} = \frac{5}{13} \therefore OR = \frac{25}{13}$ cm

M1

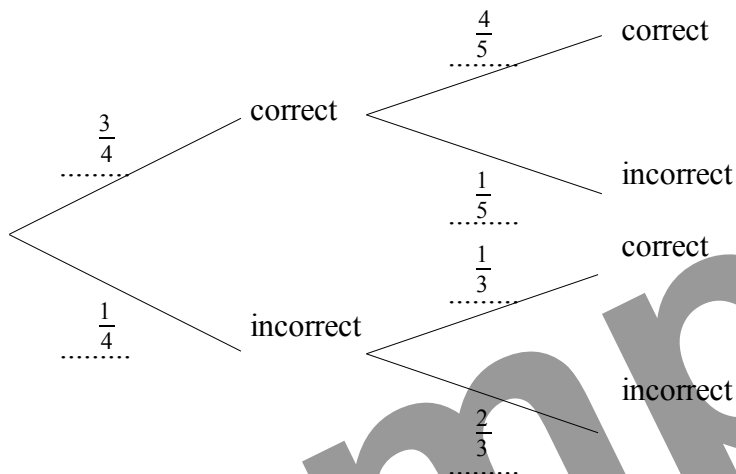
A1

M1

A1

Total 7

22. (a) part (i) part (ii) B3



(b) $= \frac{3}{4} \times \frac{4}{5} = \frac{3}{5}$ M1 A1

(c) P(both incorrect) = $\frac{1}{4} \times \frac{2}{3} = \frac{1}{6}$ M1

P(at least one correct) = $1 - \frac{1}{6} = \frac{5}{6}$ A1

estimate = $\frac{5}{6} \times 180 = 150$ M1 A1

Total 9

23. $(x - 1)^2 + (x + 1)^2 = 10^2$ M1

$x^2 - 2x + 1 + x^2 + 2x + 1 = 100$ M1

$2x^2 + 2 = 100$ A1

$x^2 = 49$ A1

$x = \pm 7$, must be +7 for lengths to be positive

rectangle measures 6 cm by 8 cm M1

area = $6 \times 8 = 48 \text{ cm}^2$ A1

Total 5

24. volume of cylinder = $\pi r^2 h$ B1

volume of cone = $\frac{1}{3} \pi (2r)^2 H = \frac{4}{3} \pi r^2 H$ M1

$\pi r^2 h = 2 \times \frac{4}{3} \pi r^2 H$ M1

$h = \frac{8}{3} H \therefore H = \frac{3}{8} h$ A1

Total 4

TOTAL FOR PAPER: 100 MARKS