

**AQA, OCR, Edexcel**

**GCSE**

# GCSE Maths

Model Solutions for AQA Paper  
1 November 2014

Name:

**M M E**

Mathsmadeeasy.co.uk

Total Marks:

AQA Nov 14 P1

1. Anna - Observation  
Brian - Questionnaire  
Carl - Controlled Experiment

2a. Square, kite & Rhombus

2b. Parallelogram has no right angles

2c. Diagonals bisect each other

3. Volume =  $l \times w \times h$

$$l = 5, w = 4, h = 3$$

since  $lw = 20$  ①  $wh = 12$  ③  
 $lh = 15$  ②

so Volume =

$$3 \times 4 \times 5 = 60 \text{ cm}^3$$

'② ÷ ①'

$$\frac{lh}{lw} = \frac{15}{20}$$

$$\frac{h}{w} = \frac{3}{4}$$

$$h = \frac{3w}{4}$$

sub in ③

$$\frac{3w^2}{4} = 12$$

$$3w^2 = 48$$

$$w^2 = 16$$

$$w = 4$$

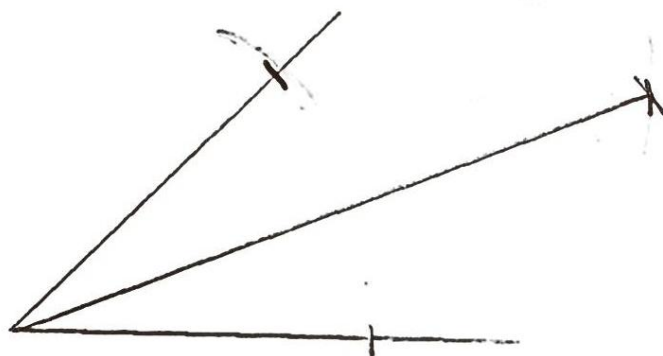
$$wh = 12 \Rightarrow 4h = 12 \quad h = 3$$

4a. No time frame in the question, e.g. per week  
 Overlapping options, i.e. which box for 1 hour?

4b.

0            1-2            3-4            5+

5.



6.

$$\begin{aligned} & 3(x+2) + 2(x-1) \\ &= 3x+6 + 2x-2 \\ &= 5x+4 \end{aligned}$$

7a.

$$s = \frac{d}{t} \quad d = s \times t \quad t = \frac{d}{s}$$

A  $d = s \times t$                        $d = 4 \times 35 = 140 \text{ km}$

B  $t = \frac{d}{s}$                        $t = \frac{180}{40} = 4.5 \text{ hours}$

C  $s = \frac{d}{t}$                        $s = \frac{150}{3} = 50 \text{ km/h}$

7b.

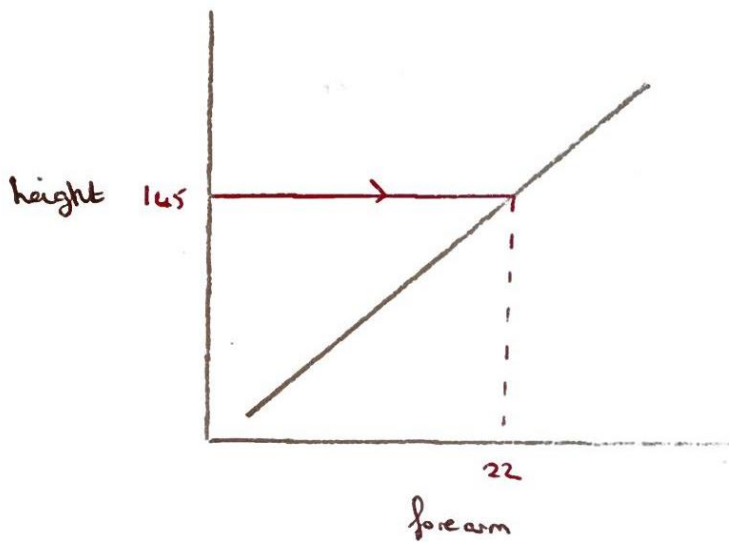
Car X takes 15 mins to go around

Car Y takes 20 mins

X	Y
15	20
30	40
45	60
60	60

Will cross together after 60 minutes

8a.



8b.

Choose Person A      f      h  
                                 11      108

$$h = 4 \times f + 60$$

$$108 = 4 \times 11 + 60$$

$$108 = 44 + 60$$

$$108 \neq 104$$

so formula doesn't work exactly

7a. modal = most common = £1200

7b. median =  $\frac{10+1}{2}$  = 5.5th person

1200 1200 1200 1200 1200 | 1400 1400 1400 2500 13500  
 £1300

7c. Manager's salary is very large, so distorts the mean

10a.  $x=3, y=5, z=0 \Rightarrow B$

10b. G

10c. (1.5, 2.5, 4)

same z value as DGF or E (=4)

y value halfway between D and E

so 2.5

x value halfway between D and G

so 2

11.  $600 + 3\% = 618$        $1\% = 6$   
 $\quad \quad \quad - \frac{200}{418}$

$418 + 3\% =$   
 $\quad \quad \quad 418$   
 $\quad \quad \quad \times 1.03$   
 $\quad \quad \quad \hline$   
 $\quad \quad \quad 1254$   
 $\quad \quad \quad \quad \quad 0$   
 $\quad \quad \quad 41800$   
 $\quad \quad \quad \hline$   
 $\quad \quad \quad 43054$   
 $\quad \quad \quad = \text{£}430.54$

12

$$2(2x+1) = 2x+7$$

$$4x+2 = 2x+7 \quad (-2x)$$

$$2x+2 = 7 \quad (-2)$$

$$2x = 5 \quad (\div 2)$$

$$x = 2.5$$

$$2(2x+1) = 2(2(2.5)+1) = 12 \text{ cm}$$

$$2x+7 = 2(2.5)+7 = 12 \text{ cm}$$

$$2x+3 = 2(2.5)+3 = 8 \text{ cm}$$

$$x+4 = 2.5+4 = 6.5 \text{ cm}$$

$$3x-2 = 3(2.5)-2 = 5.5 \text{ cm}$$

$$2x-1 = 2(2.5)-1 = 4 \text{ cm}$$

$$12 \text{ cm} = 12 \text{ cm} = 8 \text{ cm} + 4 \text{ cm} = 5.5 \text{ cm} + 6.5 \text{ cm}$$

so 4 sides all of length 12

13a

$$0.\overbrace{000000}^7 = 7 \times 10^{-7}$$

13b

$$3 \times 10^5 = 300,000$$

13c

$$4 \times 10^3 \times 8 \times 10^5$$

$$= 4 \times 8 \times 10^3 \times 10^5$$

$$= 32 \times 10^8$$

$$= 3.2 \times 10 \times 10^8 = 3.2 \times 10^9$$

4.

$$6t + 4c = 1320 \quad \textcircled{1}$$

$$5t + 4c = 1200 \quad \textcircled{2}$$

$$\textcircled{1} - \textcircled{2} \quad t = 120$$

$$\text{sub } t = 120 \text{ into } \textcircled{2} \quad 5(120) + 4c = 1200$$

$$600 + 4c = 1200 \quad (-600)$$

$$4c = 600 \quad (\div 4)$$

$$c = 150$$

so tea costs £1.20

cake cost £1.50

$$3 \text{ teas} = 3 \times \text{£}1.20 = \text{£}3.60$$

$$4 \text{ cakes} = 4 \times \text{£}1.50 = \text{£}6.00$$

$$\text{£}9.60$$

Yes, £10 is enough - you will have 40p change

15.

$$y = \frac{3x - 2}{x + 1}$$

$$y(x + 1) = 3x - 2$$

$$yx + y = 3x - 2$$

$$yx - 3x = -2 - y$$

$$x(y - 3) = -2 - y$$

$$x = \frac{-2 - y}{y - 3}$$

16a.

	F	c.w.	f.d.
$2 < c \leq 3$	13	1	13

Bar up to 13

	19	c.w.	19
$4 < c \leq 5$		1	

Bar up to 19

16b.

$3 < c \leq 4$	c.w. = 1	f.d. = 17
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so frequency = 17

$5 < c \leq 7$	c.w. = 2	f.d. = 14
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$$F = f.d. \times c.w.$$

$$= 28$$

17.

$$\text{arc length} = \frac{60}{360} \times 24\pi$$

$$= \frac{1}{6} \times 24\pi$$

$$= 4\pi$$

$r = 12$  so  $d = 24$

18.

$$x^2 + 6x + 2 = 0$$

$$(x+3)^2 - 9 + 2 = 0$$

$$(x+3)^2 - 7 = 0$$

$$(x+3)^2 = 7$$

$$x+3 = \pm \sqrt{7}$$

$$x = -3 \pm \sqrt{7}$$

(+7)

( $\sqrt{\quad}$ )

(-3)



19.

$$\hat{X}\hat{Y}\hat{Z} = 110^\circ \quad (\text{cyclic quadrilateral} - \text{opposite angles} = 180^\circ)$$

$$\hat{A}\hat{B}\hat{X} = 80^\circ \quad (\text{straight line})$$

$$\hat{B}\hat{X}\hat{Z} = 30^\circ$$

$$\hat{B}\hat{X}\hat{Y} = 70^\circ \quad \hat{Z}\hat{X}\hat{Y} = 70 - 30 = 40^\circ$$

20a.

$$\sqrt{50} + \sqrt{32}$$

$$= \sqrt{25 \times 2} + \sqrt{16 \times 2}$$

$$= 5\sqrt{2} + 4\sqrt{2}$$

$$= 9\sqrt{2}$$

20b.

$$4\sqrt{75} \div 2\sqrt{3}$$

$$= 4\sqrt{25 \times 3} \div 2\sqrt{3}$$

$$= 20\sqrt{3} \div 2\sqrt{3}$$

$$= 10\sqrt{3}$$

21.

$$3^x = 9^{x+1}$$

$$3^x = (3^2)^{x+1}$$

$$3^x = 3^{2x+2}$$

$$x = 2x + 2 \quad (-2x)$$

$$-x = 2$$

$$x = -2$$