

AQA, OCR, Edexcel

GCSE

GCSE Maths

Model Solutions for AQA Paper
1 January 2013

Name:

M

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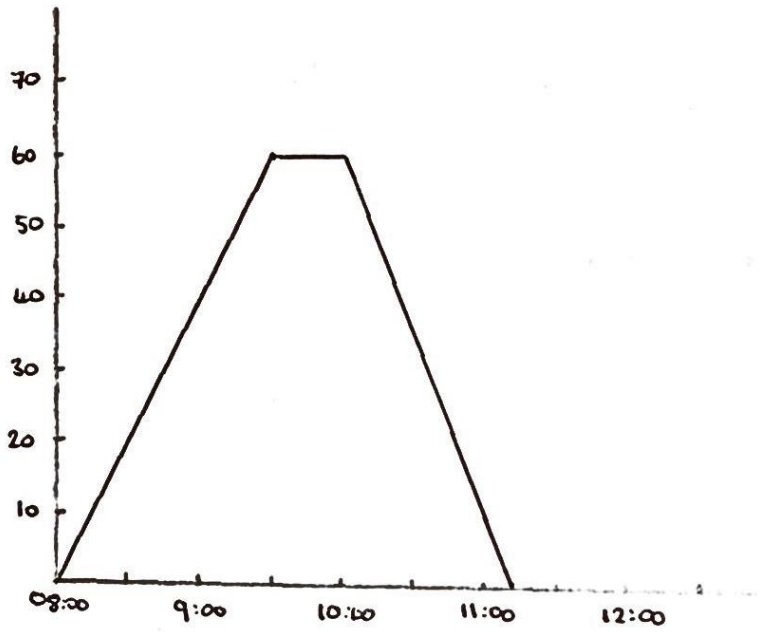
E

Mathsmadeeasy.co.uk

Total Marks:

AGA Jan 13 P1

1a.

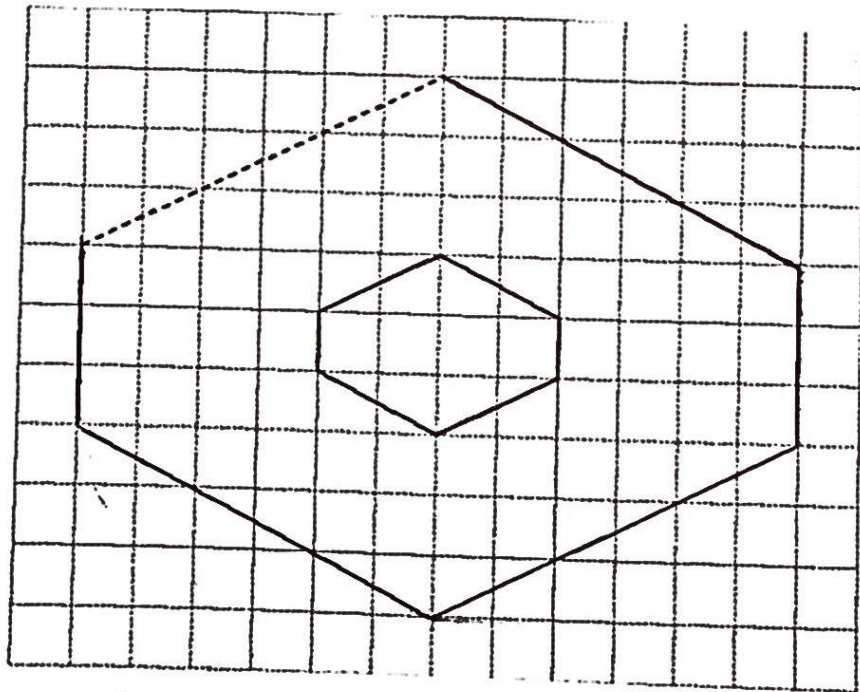


60 miles at 50 mph takes 1hr 12 mins

1b.

Yes, he arrives home at 11:12, so is back in time.

2a.



2b.

s.f. 3

3.

$$\begin{aligned}5x - 9 &= 3x + 11 && (-3x) \\2x - 9 &= 11 && (+9) \\2x &= 20 && (\div 2) \\x &= 10\end{aligned}$$

4a.

$$\begin{aligned}d &= s \times t && 20 \text{ mins} = \frac{1}{3} \text{ hour} \\d &= 75 \times \frac{1}{3} \\&= 25 \text{ km}\end{aligned}$$

4b

$$\begin{aligned}5 \text{ m} &= 8 \text{ km} \\50 \text{ mph} &= 80 \text{ kmph} \\ \text{Scooter travels at } &75 \text{ kmph} \\75 \text{ kmph} &< 80 \text{ kmph} \\ \therefore &\text{ slower than speed limit}\end{aligned}$$

5a.

$$3^3 = 3 \times 3 \times 3 = 27$$

5b.

$$3^4 = 3 \times 3 \times 3 \times 3 = 81$$

5b.

$$\begin{aligned}729 \times 2187 &= 1594323 \\3^6 \times 3^7 &= 3^{13} \\x &= 13\end{aligned}$$

5c.

$$\frac{2187}{9} = \frac{3^7}{3^2} = 3^5$$

6.

4	12	10	26
15	5	6	26
60	60	60	

7a.

1st	2nd	3rd
x	$2x+5$	$2(2x+5)+5$

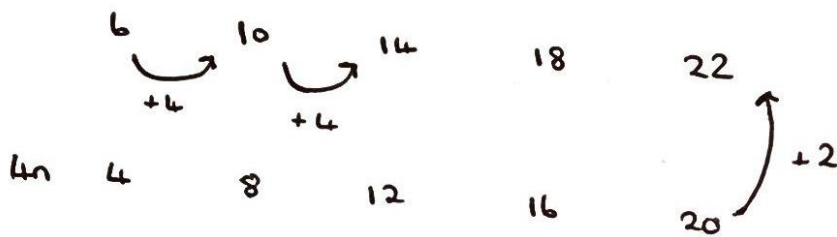
$$2(2x+5)+5 = 27$$

$$4x + 10 + 5 = 27 \quad (-15)$$

$$4x = 12 \quad (\div 4)$$

$$x = 3$$

7b.



$$4n + 2$$

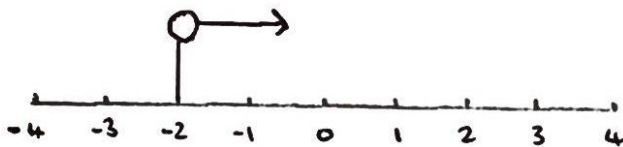
8.

Area of circle = πr^2

$r = 6$, area of whole circle : $\pi \times 6^2$
 $= 36\pi$

\therefore area of semicircle : $\frac{36\pi}{2}$
 $= 18\pi \text{ cm}^2$

9a.



9b.

$$3x + 5 \leq 11 \quad (-5)$$

$$3x \leq 6 \quad (\div 3)$$

$$x \leq 2$$

10. 4 7 x y 11

median = x

x > 7, try x = 8

4 7 8 y 11
 ~~10~~

$$\text{mean} = \frac{4 + 7 + 8 + y + 11}{5} = 8 \quad (\times 5)$$

$$4 + 7 + 8 + y + 11 = 40$$

$$30 + y = 40$$

$$y = 10$$

$$\therefore x = 8, \quad y = 10$$

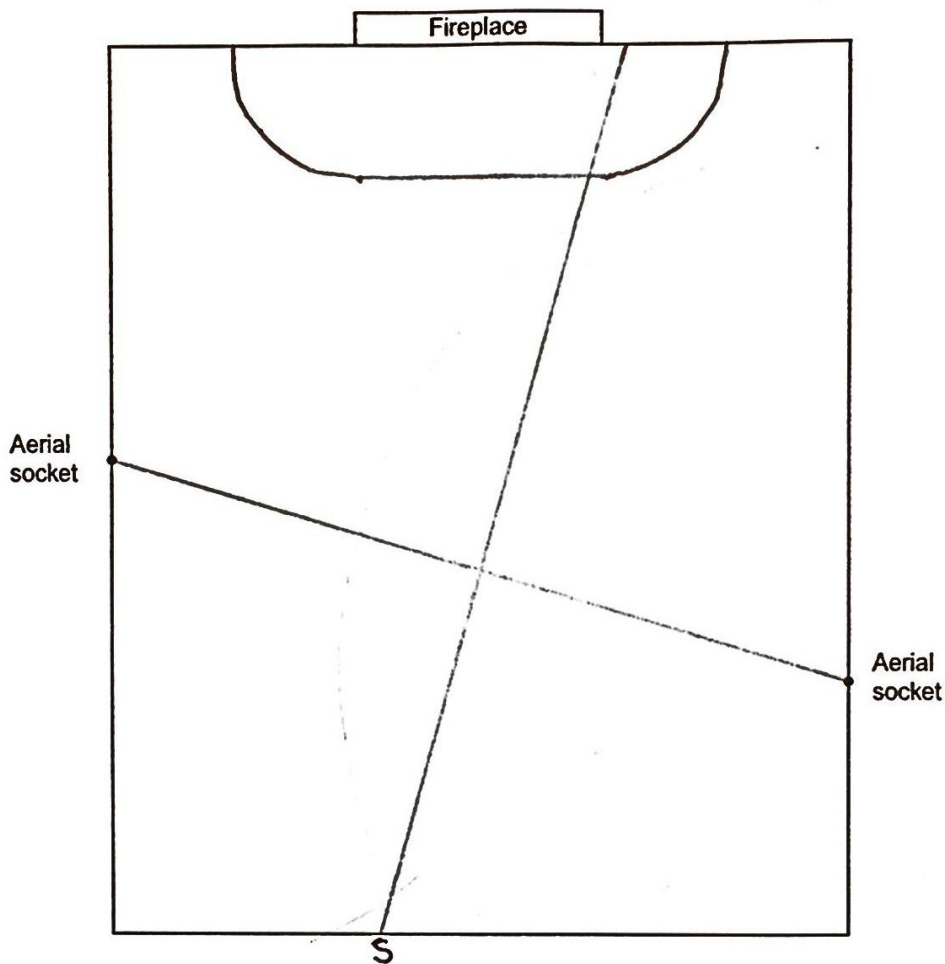
11. $V = \pi r^2 h$, $r = 10$, $h = 4$, $\pi \approx 3.1$

$$V = 3.1 \times 10^2 \times 4$$

$$= 3.1 \times 400$$

$$= 1240 \text{ cm}^3$$

12



13.

$$x(y+6) - (xy+4) \equiv 2(3x-2)$$

$$\begin{aligned} \text{LHS: } & x(y+6) - (xy+4) \\ & = xy + 6x - xy - 4 \\ & = 6x - 4 \\ & = 2(3x-2) \quad \text{RHS} \end{aligned}$$

14.

$$\frac{2x+3}{4} - \frac{3x-3}{2} = 2 \quad (\times 4)$$

$$2x+3 - 2(3x-3) = 8$$

$$2x+3 - 6x + 6 = 8$$

$$-4x + 9 = 8 \quad (-9)$$

$$-4x = -1 \quad (\div -4)$$

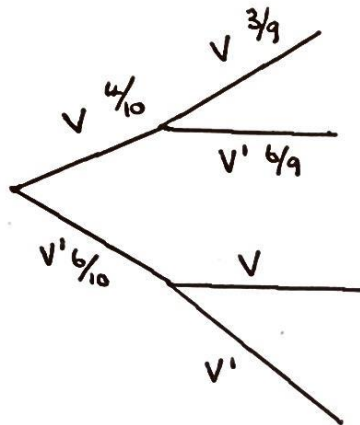
$$x = \frac{1}{4}$$

15a. Boys = $0.1 \times 400 = 40$

Girls = $0.2 \times 500 = 100$

$40 + 100 = 140$

15b.



$$\begin{aligned}
 P(VV) &= \frac{4}{10} \times \frac{3}{9} \\
 &= \frac{4}{10} \times \frac{1}{3} \\
 &= \frac{4}{30} \\
 &= \frac{2}{15}
 \end{aligned}$$

16.

$$\begin{aligned}
 TSA &= \pi r^2 + \pi r l = 24\pi && (\div \pi) \\
 r^2 + r l &= 24 && (r=3) \\
 3^2 + 3l &= 24 && (-9) \\
 3l &= 15 && (\div 3) \\
 l &= 5
 \end{aligned}$$

17a.

$$\sqrt{75} = \sqrt{25 \times 3} = \sqrt{25} \times \sqrt{3} = 5\sqrt{3}$$

17b.

$$\frac{6}{\sqrt{3}} \times (\sqrt{3})$$

$$\frac{6\sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{6\sqrt{3}}{3} = 2\sqrt{3}$$

17c.

$$\sqrt{75} + \sqrt{75} + \frac{6}{\sqrt{3}}$$

$$5\sqrt{3} + 5\sqrt{3} + 2\sqrt{3} = 12\sqrt{3}$$

$$\text{mean} = \frac{12\sqrt{3}}{3} = 4\sqrt{3}$$

18.

$$\frac{9x^2 - 1}{3x^2 + 2x - 1} \div \frac{3x + 1}{x - 2}$$

$$= \frac{\cancel{(3x+1)}\cancel{(3x-1)}}{\cancel{(3x-1)}(x+1)} \times \frac{x-2}{\cancel{3x+1}}$$

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

19.

interval	area of bars (1:11k 1mm squares)
6 - 10	60
10 - 12	80
12 - 14	110
14 - 15	115
15 - 16	95
16 - 20	40
	<hr/> 500

500 1mm squares = 500 mice

so each 1mm square represents 1 mouse

60 squares for 6-10

\therefore 60 mice less than 10g