

## General Paper 2 Exam Solutions 2002

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1. Given John drives from Edinburgh to Inverness at an average speed of 76km/hr and this takes 3 hours 45 minutes. To calculate the distance we have:

Changing 3 hours 45 mins to hours only

$$3 + \frac{45}{60} = 3 + 0.75 = 3.75 \text{ hours}$$

$$\begin{aligned} \text{Distance} &= \text{speed} \times \text{time} \\ &= 76 \times 3.75 \\ &= 285\text{km} \end{aligned}$$

2. (a) Given the special offer for the computer is £779 + VAT @17.5%. To calculate the total cost we have:

$$\begin{aligned} 1.175 \times 779 &= \text{£}915.325 \\ &= \text{£}915.325 \text{ (to the nearest penny)} \end{aligned}$$

- (b) Given Andrea see a deal at £900 including VAT and the special offer in part (a) says they "will refund double the difference if you see it cheaper within a month". She will get back:

$$\begin{aligned} 915.33 - 900 &= \text{£}15.33 \\ 15.33 \times 2 &= \text{£}30.66 \end{aligned}$$

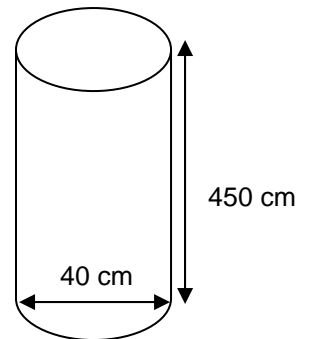
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- 3 (a) Given the diagram of the cylinder and the dimensions.  
To calculate the volume we have:

$$\begin{aligned} \text{Volume} &= \pi \times r^2 \times h \\ &= \pi \times 20^2 \times 450 \\ &= 565487\text{cm}^3 \end{aligned}$$



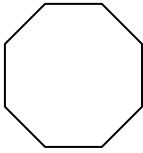
- (b) In scientific notation the answer in part (a) is:

$$5.65487 \times 10^5 \text{cm}^3$$

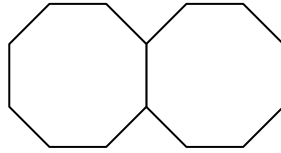
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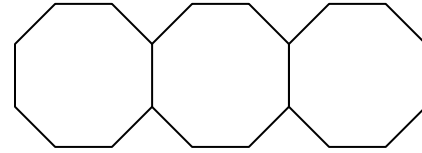
4. Given the patterns.



Section 1



Section 2



Section 3

(a) Completing the table we get:

Number of section ( $s$ )	1	2	3	4		12
Number of iron bars ( $b$ )	8	15	22	29		85

(b) Steps for working out the rule:

1. Difference is 7
2. Part of rule is  $7s$
3. Correction factor, so that the rule works is, add on 1

$7 \times 1 + 1 = 20$

Full rule is:  $b = 7s + 1$  = Check !!!!

(c) Given a fence has 176 iron bars. To calculate the number of sections we have:

$$176 = 7s + 1$$

$$7s = 176 - 1$$

$$7s = 175$$

$$s = \frac{175}{7} = 25$$

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5. Given the sum of £1640 invested in a bank at simple interest of 4.5%.  
After 9 months it will be worth:

4.5% of 1640  
1% → 16.40  
0.5% → £8.20  
4% → £65.60  
4.5% → £73.80

Since 9 months is  $\frac{3}{4}$  of a year we have:

$$\frac{3}{4} \times 73.80 = 73.80 \div 4 \times 3 = 55.35$$

Total interest is £55.35

6. Given that PQRS is a rhombus and the dimensions.  
To calculate the shaded angle we have:

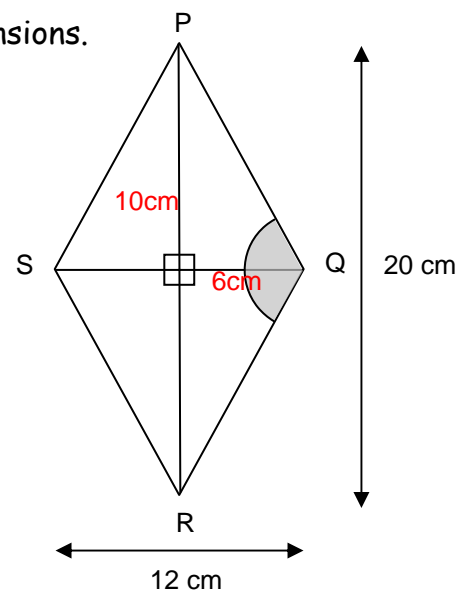
Knowing the properties of a rhombus and

using (S°H)(C^H)(T°A)

$$\angle PQS = \tan^{-1}\left(\frac{10}{6}\right) = 59^\circ$$

Hence shaded area PQR has angle

$$59^\circ \times 2 = 118^\circ$$



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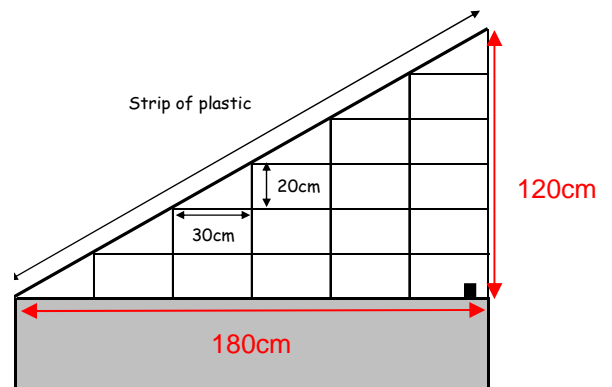
7. Given the diagram and measurements, the total goal height is:

Using Pythagoras  
the length of the strip ( $s$ ) is:

$$s = \sqrt{180^2 + 120^2}$$

$$s = \sqrt{46800}$$

$$s = 216.3 \text{ cm}$$



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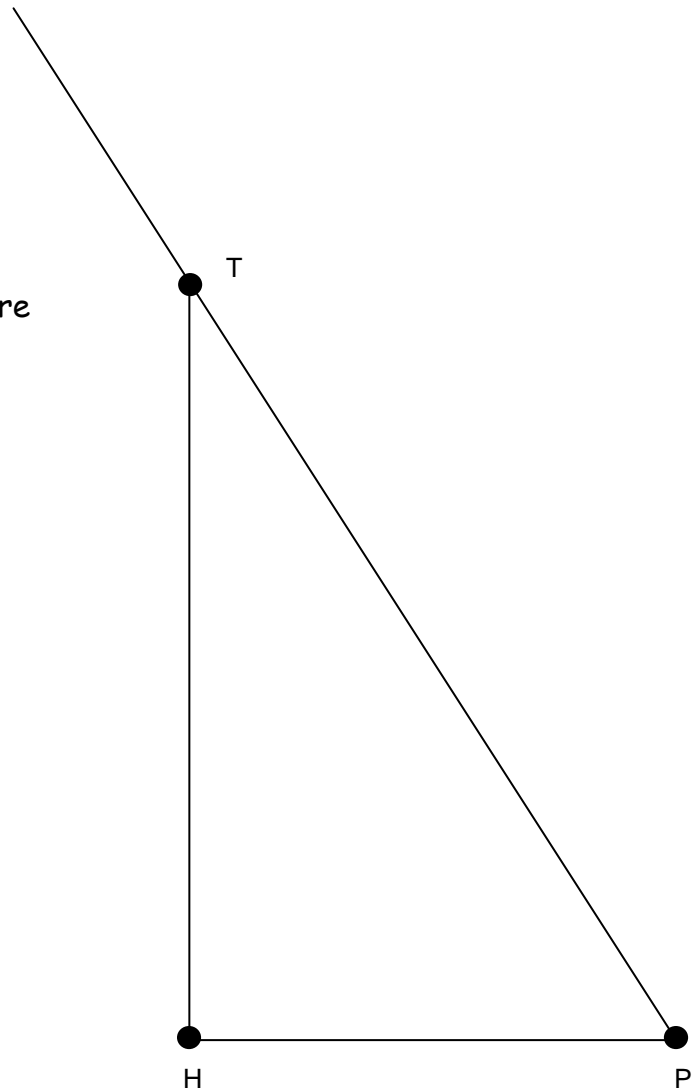
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8. (a) Drawing the diagram using the scale of 1:2 we get:

- (b) Measuring the length of PT we get 12.5cm.

The real length therefore is:

$$12.5 \times 2 = 25\text{cm}$$



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9. (a) Solving the equation we get:  
(Remember change side change sign)

$$\begin{aligned} 4(3x + 2) &= 68 \\ 12x + 8 &= 68 \\ 12x &= 68 - 8 \\ 12x &= 60 \\ x &= \frac{60}{12} \\ x &= 5 \end{aligned}$$

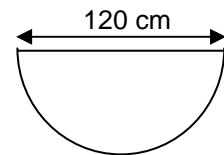
- (b) Factorising we get:

$$10y + 15 = 5(2y + 3)$$

10. Given the semi-circle table diagram and dimensions.

- (a) To calculate the length of the metal trim round the perimeter we have:

$$\begin{aligned} P &= \frac{1}{2} \times \pi \times D + D \\ &= \frac{1}{2} \times \pi \times 120 + 120 \\ &= 308.4\text{cm} \end{aligned}$$



- (b) Given 16 tables need metal trim and the joiner has 50m of trim.

$$50\text{m} \rightarrow 5000\text{cm}$$

$$16 \overline{) 5000} \begin{array}{r} 49.36 \\ \underline{16} \phantom{00} \\ 36 \phantom{00} \\ \underline{32} \phantom{00} \\ 40 \phantom{00} \\ \underline{32} \phantom{00} \\ 80 \phantom{00} \\ \underline{80} \phantom{00} \\ 0 \end{array} \text{ the joiner has enough material}$$

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11. Given the hire purchase price is 22% greater than the cash price of £6300. The hire purchase agreement requires a deposit of 15% of the cash price, followed by 60 equal instalments.

To calculate the cost of each instalment:

$$\text{H.P.} = 6300 + 6300 \times 0.22 = \text{£}7686$$

$$\text{Deposit} = 6300 \times 0.15 = \text{£}945$$

$$\text{Still to pay } \text{£}7686 - \text{£}945 = \text{£}6741$$

Instalments are :

$$60 \overline{)6741.00} \quad \text{£}112.35$$