Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE

General Certificate of Secondary Education

WJEC CBAC

CYD-BWYLLGOR ADDYSG CYMRU

Tystysgrif Gyffredinol Addysg Uwchradd

SOLUTIONS

185/02

MATHEMATICS

PILOT EXAMINATION

FOUNDATION TIER PAPER 2

A.M. MONDAY, 12 June 2006

(2 Hours)

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1	6	
2	7	
3	3	
4	5	
5	4	
6	7	
7	6	
8	7	
9	12	
10	7	
11	6	
12	4	
13	4	
14	10	
15	3	
16	4	
17	5	
TOTAL MARK		

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

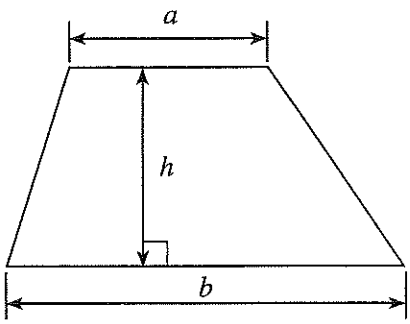
Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

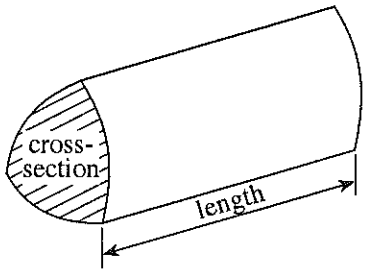
No certificate will be awarded to a candidate detected in any unfair practice during the examination.

Formula List

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross-section × length



1. *(a)* Complete the following bill.

Item	Cost
4 CDs costing £9.98 each	£ 39.92
3 ink cartridges at £21.55 each	£ 64.65
5 packets of paper at £3.67 per packet	£ 18.35
Total	£ 122.92

[4]

(b) A bag of sand costs £2.56. How many full bags of sand can be bought for £40?

$40 \div 2.56$

$= 15.625$

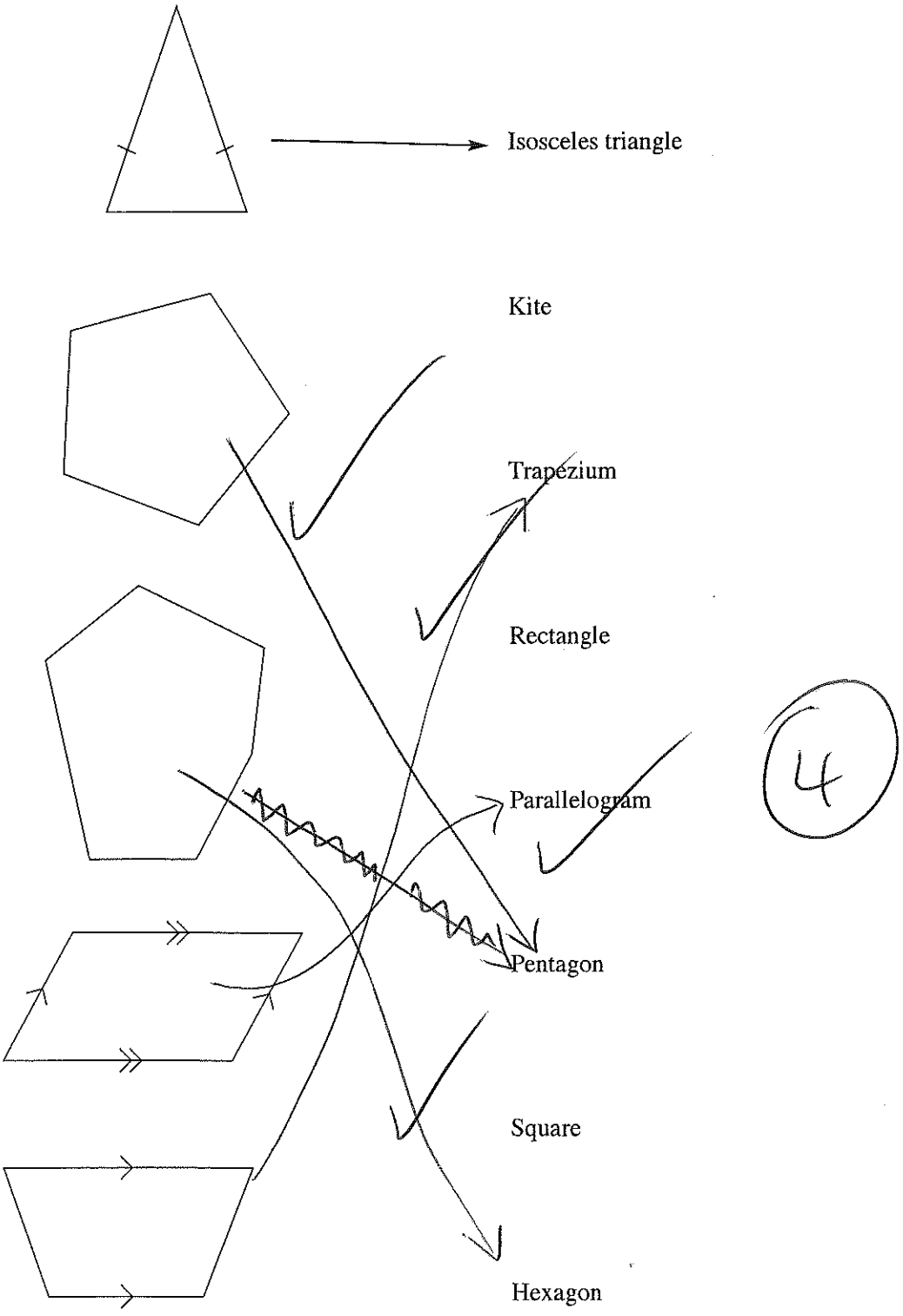
∴ 15

[2]

6

2. *(a)* Draw lines connecting **each** of the following shapes to its correct name. One line has been drawn for you.

[4]

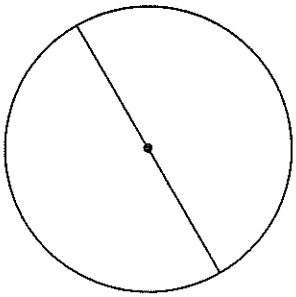


4

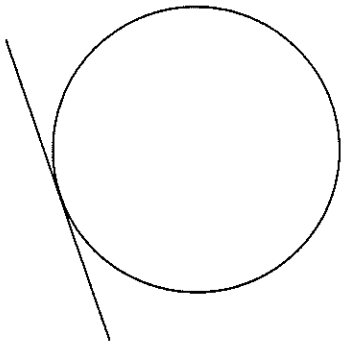
(b) Using the following list of words, write down the correct name for **each** of the **straight lines** drawn on the following diagrams.

[3]

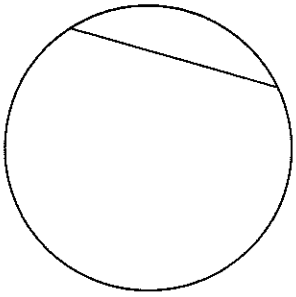
Radius **Circumference** **Arc** **Diameter** **Chord** **Tangent**



Diameter



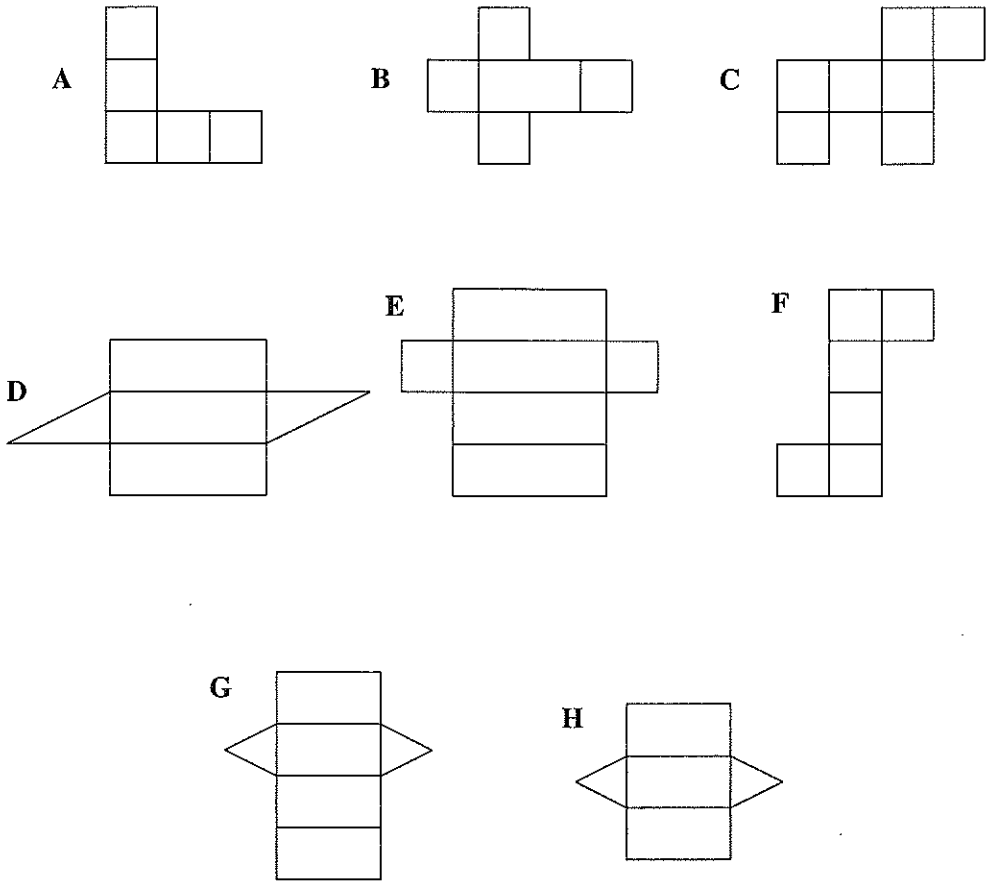
tangent



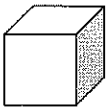
chord

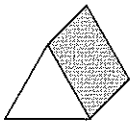
3

3. *(a)*



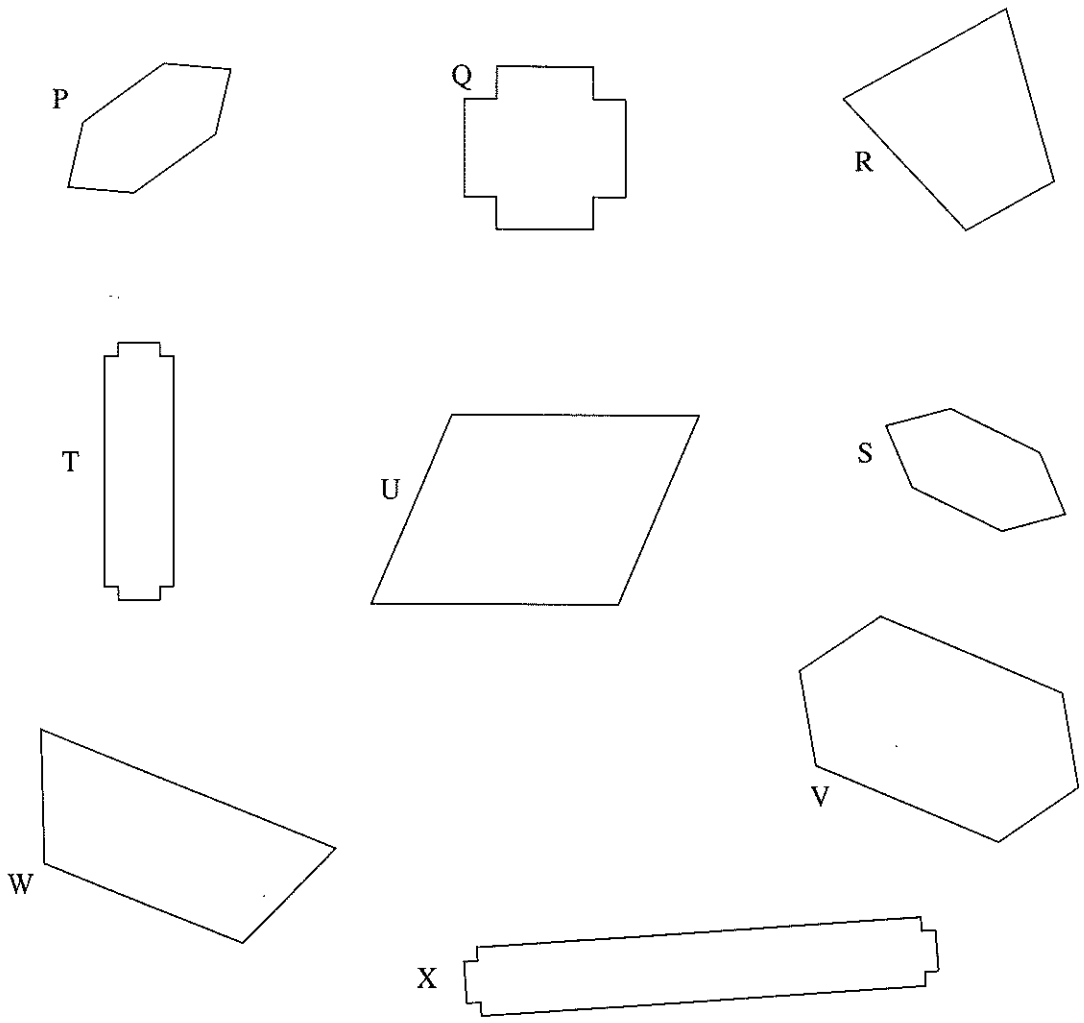
Which of the above lettered nets is

(i) the net of a cube,  F ✓

(ii) the net of a triangular prism?  H

[2]

(b) Which pair of the following shapes are congruent?



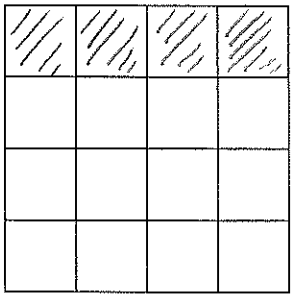
The congruent shapes are P, S [1]

4. *(a)* Write in words the number 7904.

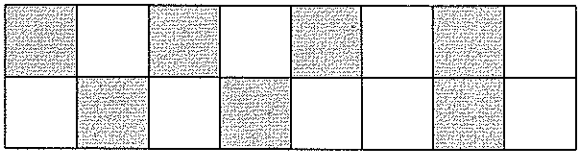
Seven thousand nine hundred and four

[1]

(b) (i) Shade 25% of the following figure.



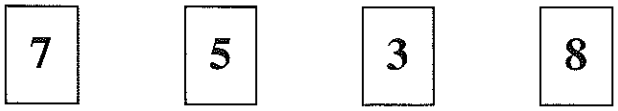
(ii) What fraction of the following shape is shaded?



$\frac{7}{16}$

[2]

(c) The numbers 7, 5, 3 and 8 are printed on four cards.



Arrange the cards to make

the largest four digit number, 8 7 5 3

the smallest four digit number. 3 5 7 8

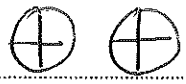
[2]

5. The number of children visiting a museum each day for one week is shown in the following table.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Number of children	200	300	150	225	175

Draw a pictogram to illustrate the data given in the above table using the symbol

 to represent 100 children.

Monday 

Tuesday 

Wednesday 

Thursday 

Friday 

[4]

6. *(a)* The symbol ❤ is used to make the following patterns.

1st pattern 2nd pattern 3rd pattern

How many of the ❤ symbols will be needed to draw the 4th pattern?

8 + 10 + 12

= 30

[2]

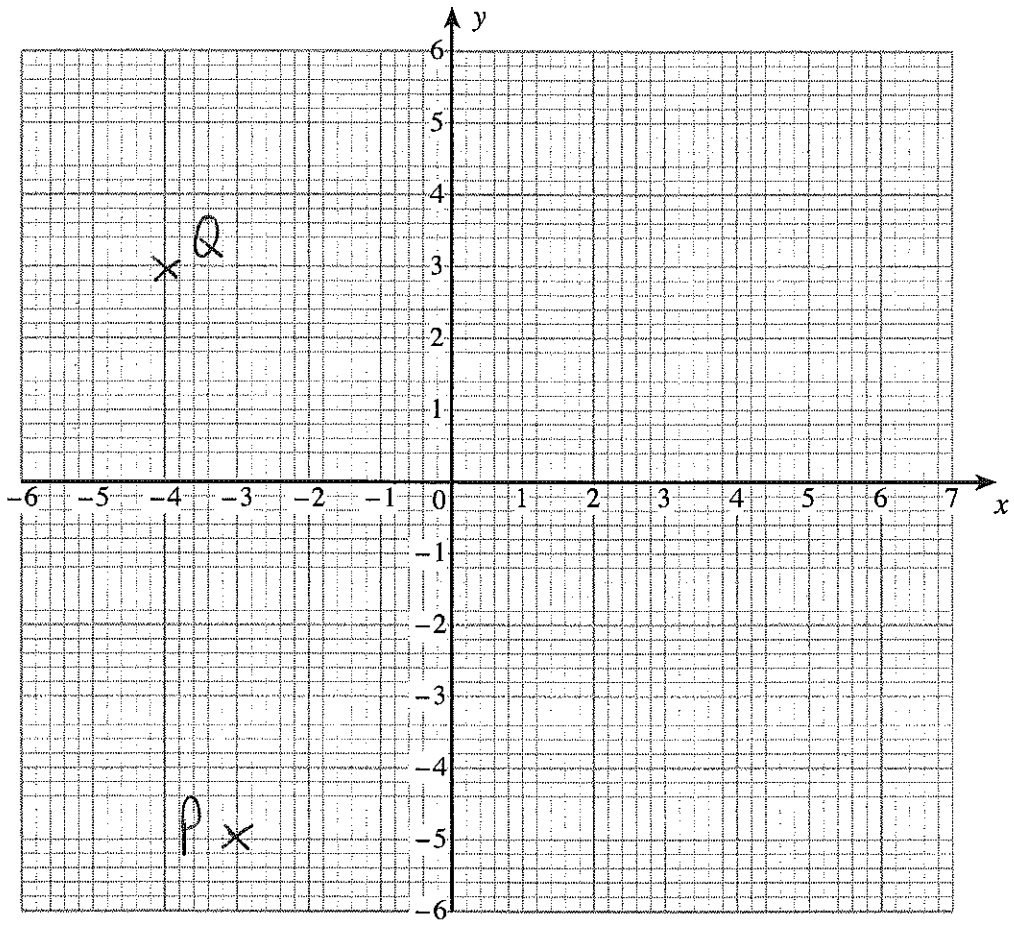
(b) When a number is divided by 6 and then 3 is taken away from the result, the answer is 8. What is the number?

(8 + 3) × 6

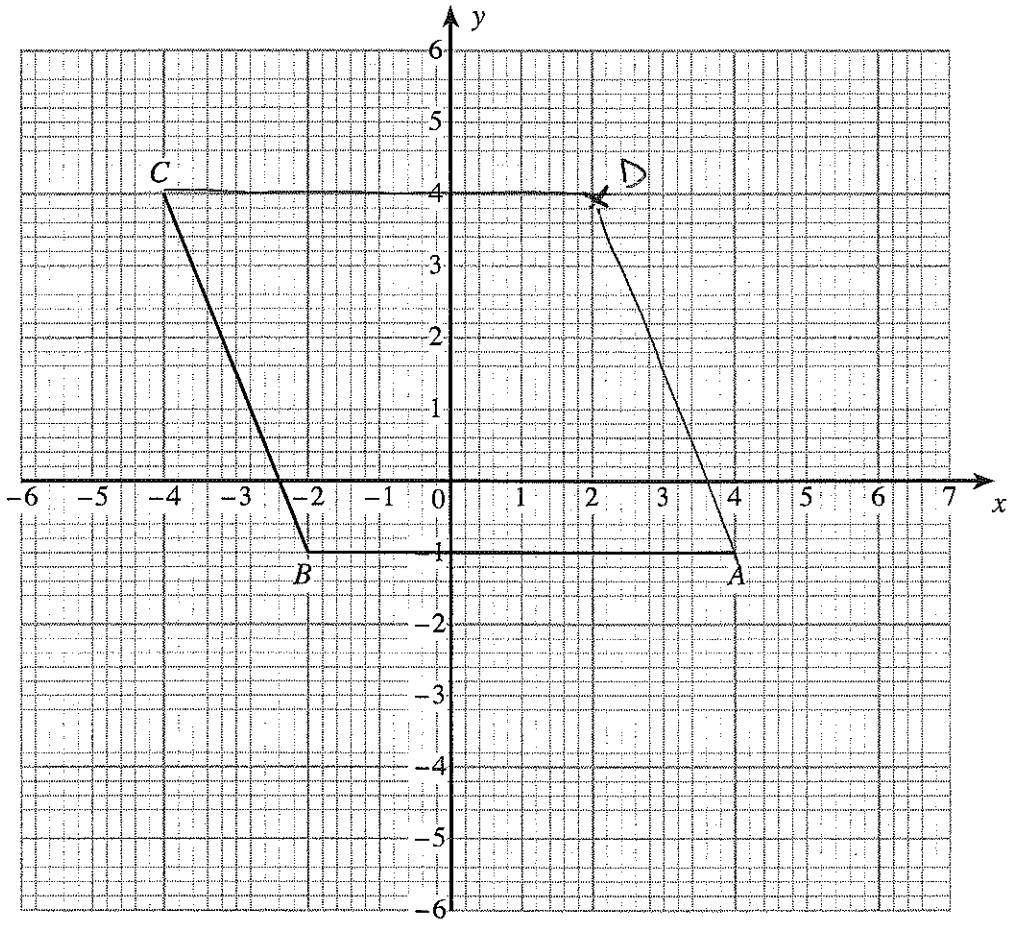
= 66

[2]

(c) (i) On the graph paper below plot the points $P(-3, -5)$ and $Q(-4, 3)$.



(ii)



Write down the coordinates of the point D so that $ABCD$ is a parallelogram.

Coordinates of D are (2 , 4)

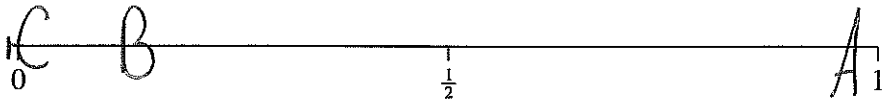
[3]

7. *(a)* Using the probability scale below mark the points A, B and C where

A is the probability that there will be snow on the top of Mount Everest in December.

B is the probability that the score will be 3 when an ordinary dice is rolled.

C is the probability that every pupil in your class will have a birthday tomorrow.



[3]

(b) A shopkeeper recorded the number of magazines sold each week for 12 successive weeks. The result was:

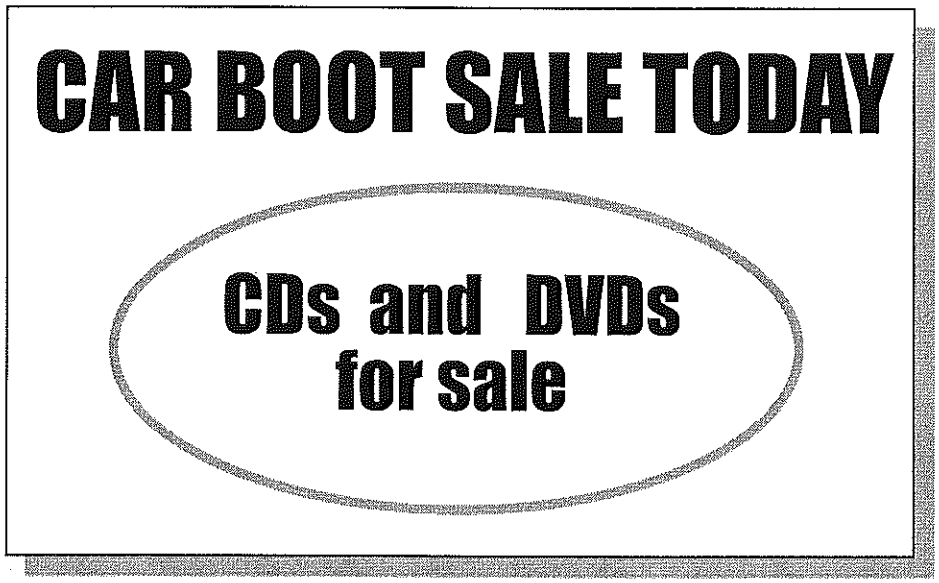
56 + 68 + 54 + 76 + 69 + 48 + 83 + 88 + 67 + 58 + 76 + 85

Calculate the mean number of magazines sold each week.

$\frac{828}{12} = 69$

[3]

8. *(a)*



In a car boot sale, Derek bought 27 CDs and 9 DVDs.
The total cost was £149.40.
Each CD cost £3.75.

Find the cost of each DVD.

$27 \times 3.75 = £101.25$

$149.40 - 101.25 = £48.15$

$48.15 \div 9 = £5.35$

[5]

(b) Roberta buys a table and four chairs.
The marked price for all the items is £650.
By how much will the price be reduced when the shop gives a discount of 12%?

$1\% = £6.50$

$12 \times 6.50 = £78$

[2]

9. *(a)* The secretary of a club has 450 books of raffle tickets.
The books are shared equally between the 32 members of the club.
How many books does each member receive and how many books will be left?

$\frac{450}{32} = 14 \cdot 06$ ∴ 14 books.

$14 \times 32 = 448$ ∴ 2 Books left over. [2]

Each member is given 14 books.

The secretary has 2 books left.

(b) (i) Find $\sqrt{3 \cdot 61}$.

1.9

(ii) Find the value of $\frac{1}{0 \cdot 8^2}$.

1.5625

(iii) Find the value of $2^4 \times 3^3$.

16×27

$= 432$

(iv) Write 4·7563 correct to two decimal places.

4.76

[6]

(c) Carl has £500.

He saves $\frac{2}{5}$ of the £500 and spends $\frac{1}{4}$ of the £500.

What fraction of the £500 does Carl have left?

$\frac{2}{5} + \frac{1}{4}$

$= \frac{8}{20} + \frac{5}{20}$

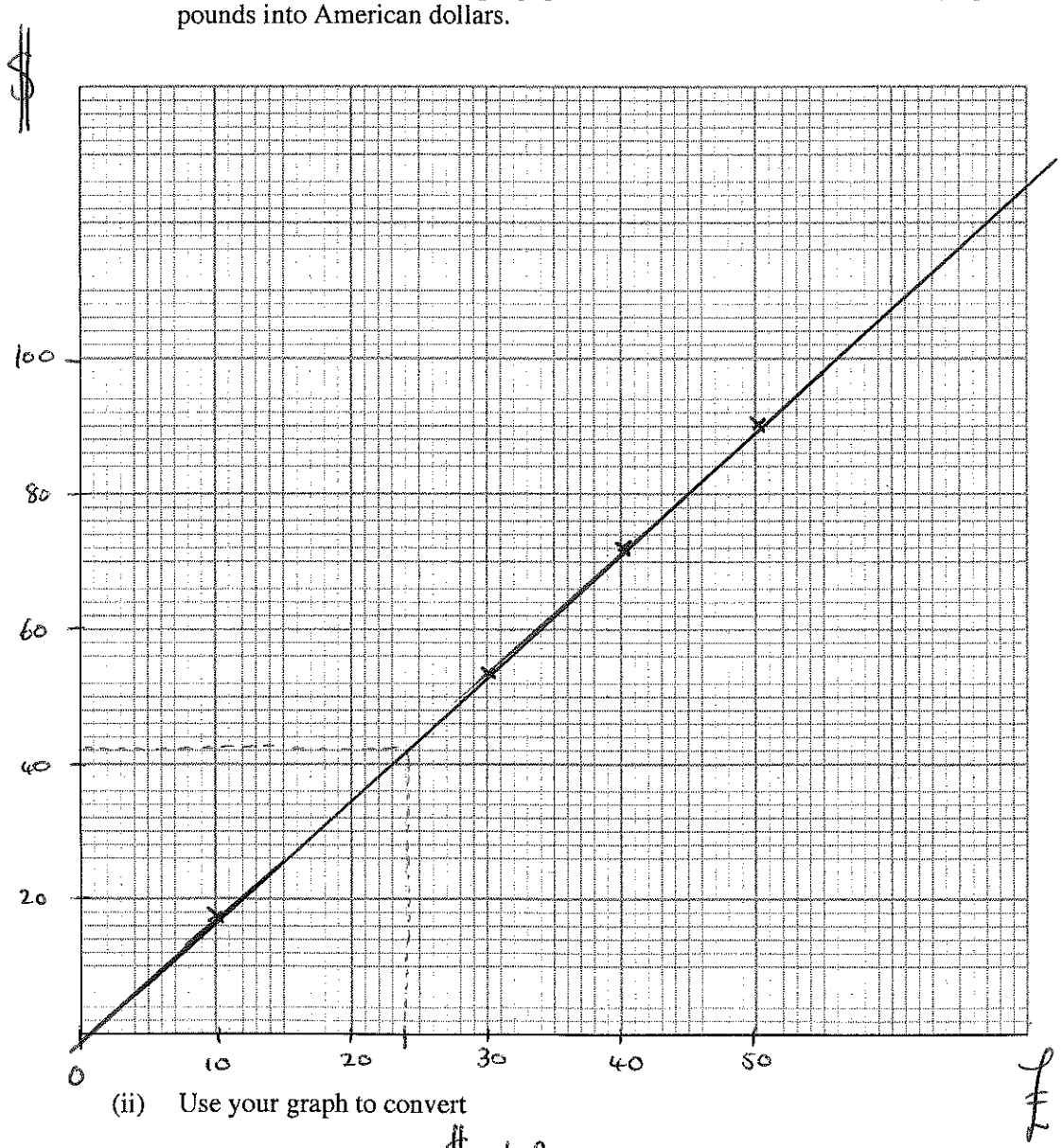
$= \frac{13}{20}$ [4]

∴ $\frac{7}{20}$ left.

10. *(a)* The following table shows how many American dollars a bank will give for various sums of money in pounds.

Pounds (£)	10	30	40	50
American dollars ($)	18	54	72	90

(i) Use the table and the graph paper below, to draw a conversion graph to change pounds into American dollars.

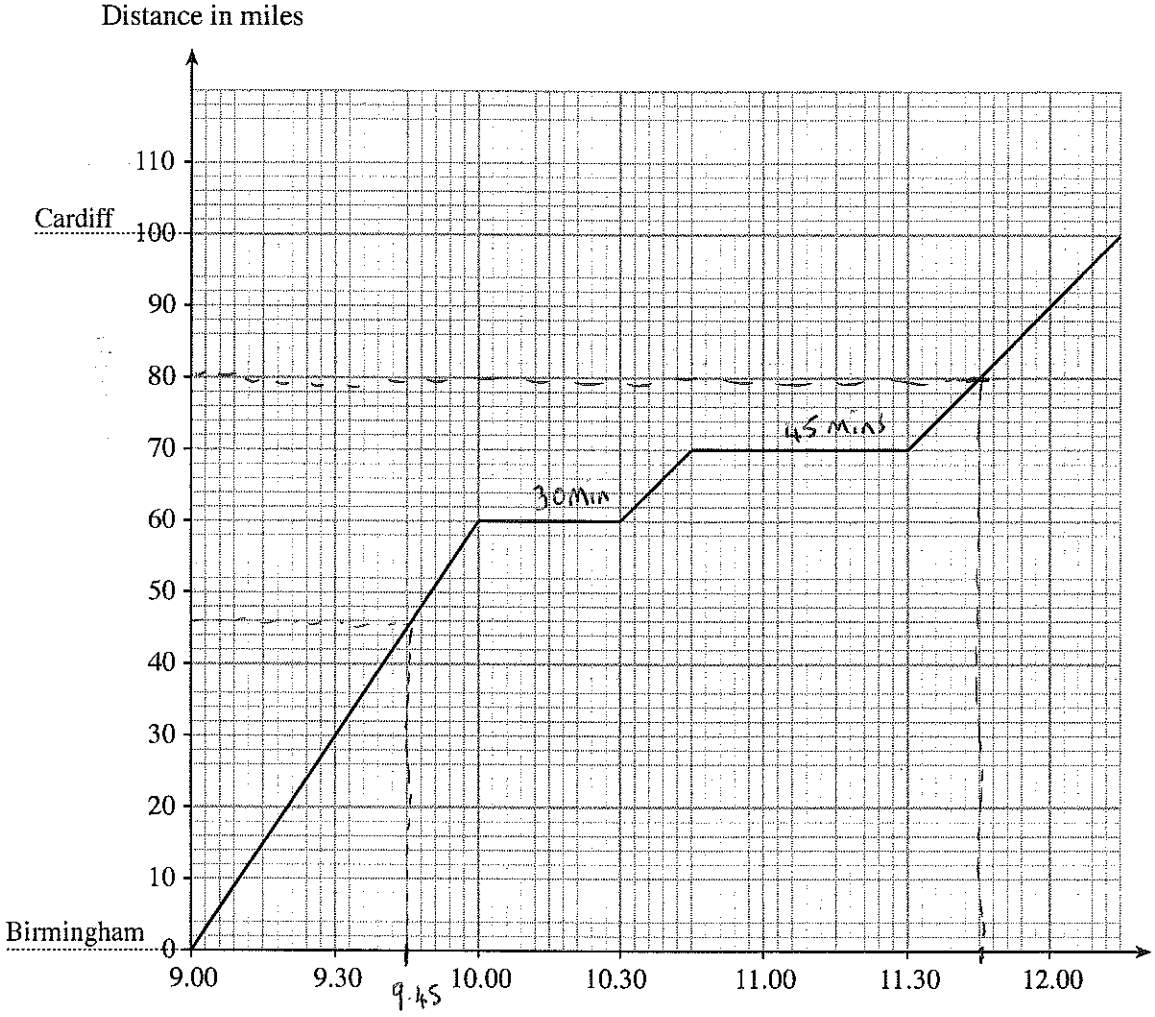


(ii) Use your graph to convert

24 pounds into dollars ..... $ 42 .....

[4]

(b) By road, Cardiff is 100 miles from Birmingham. The graph below shows Christopher's journey by car from Birmingham to Cardiff.



(i) How far did Christopher travel in the first 45 minutes?

46 miles

(ii) What is the total time that Christopher was at rest?

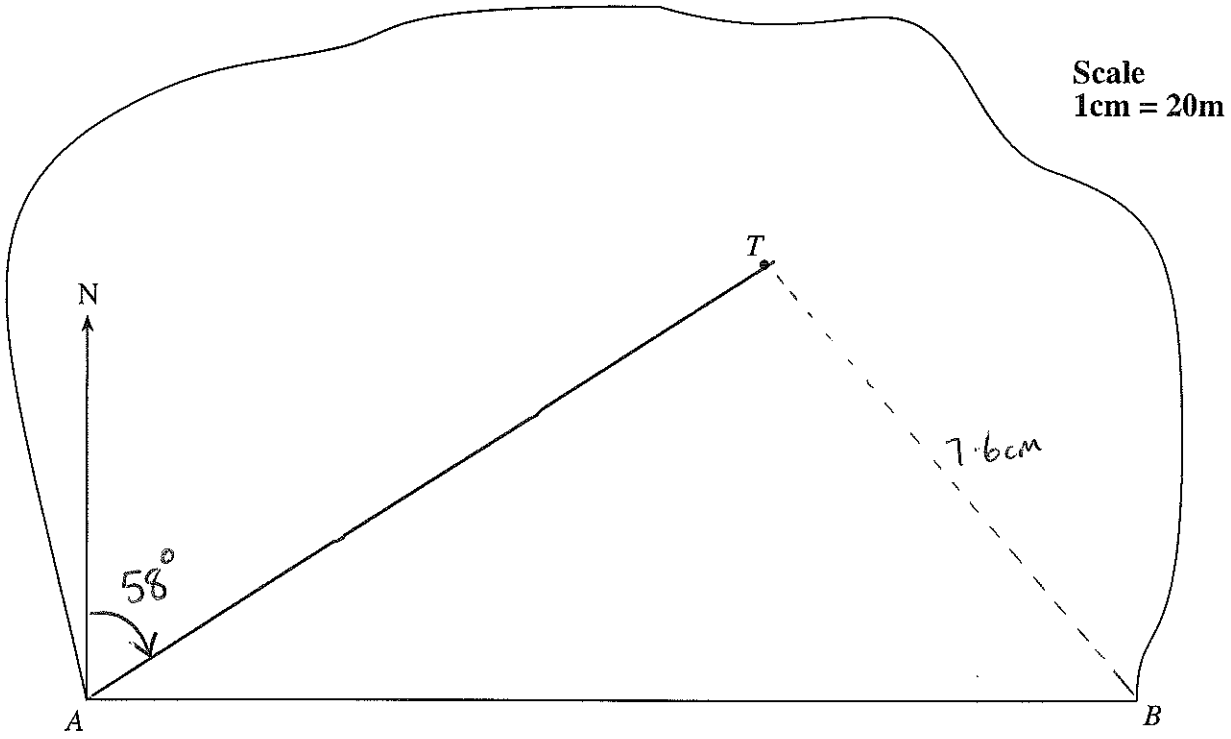
75 mins = 1 hr 15 min

(iii) How far from Cardiff was Christopher at 11.45?

100 − 80 = 20 miles

[3]

11. *(a)* The diagram below is a scale drawing of a large field.
AB is a side of the field with *B* due east of *A*.
A telephone mast is located at the point *T*.



(i) Find the bearing of *T* from *A*. 058°

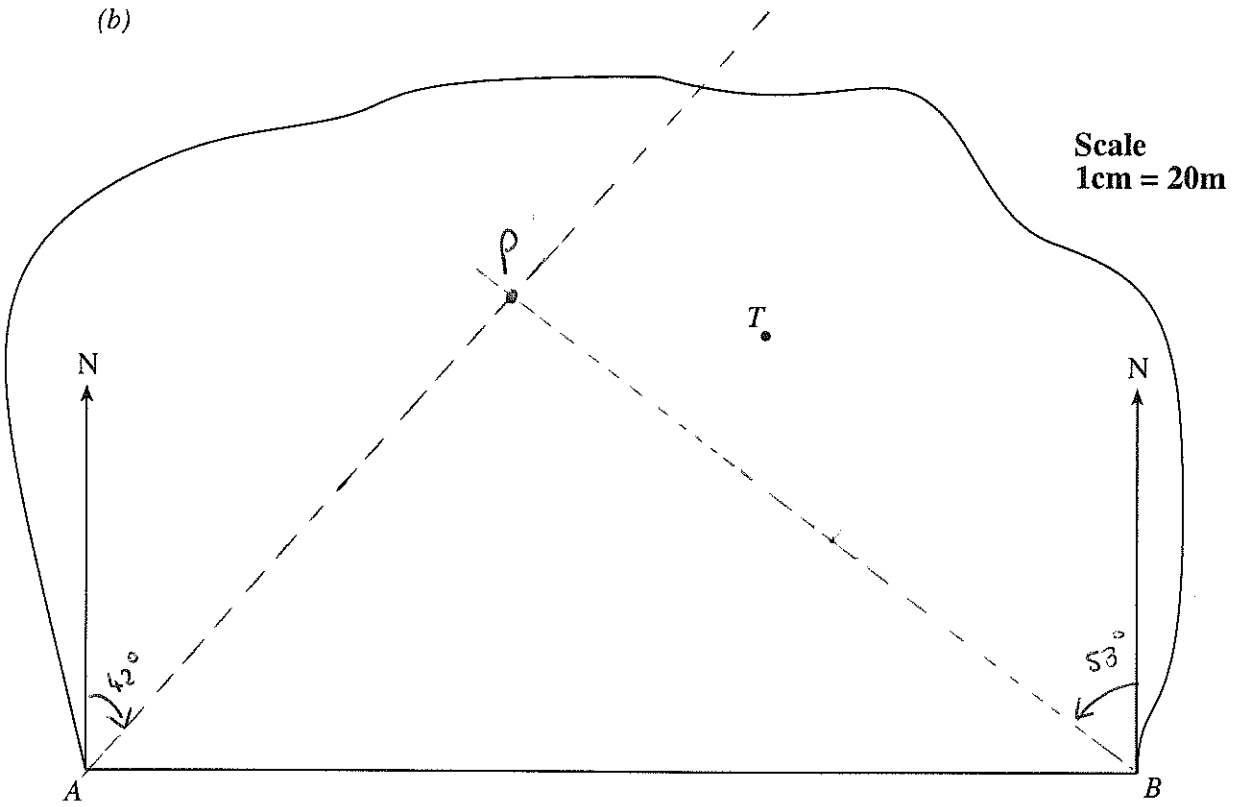
(ii) Find the **actual distance** of the telephone mast *T* from *B*.

7·6cm = 7·6 x 20

= 152m.

[3]

(b)



A pylon is to be built at a point *P*.
The bearing of *P* from *A* is 042°, and the bearing of *P* from *B* is 307°.
Find the position of *P* on the above diagram.

[3]

12. *(a)* Jenny changed £450 into Egyptian pounds when the exchange rate was £1 = 9.8 Egyptian pounds.
How many Egyptian pounds did Jenny receive?

450×9.8

$= 4410$ EP.

[2]

(b) While in Egypt, Jenny bought a camera. The camera cost 627.2 Egyptian pounds.
Using the same exchange rate as in part *(a)*, calculate the cost of the camera in £.

$\frac{627.2}{9.8} = £64$

[2]

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13. *(a)*

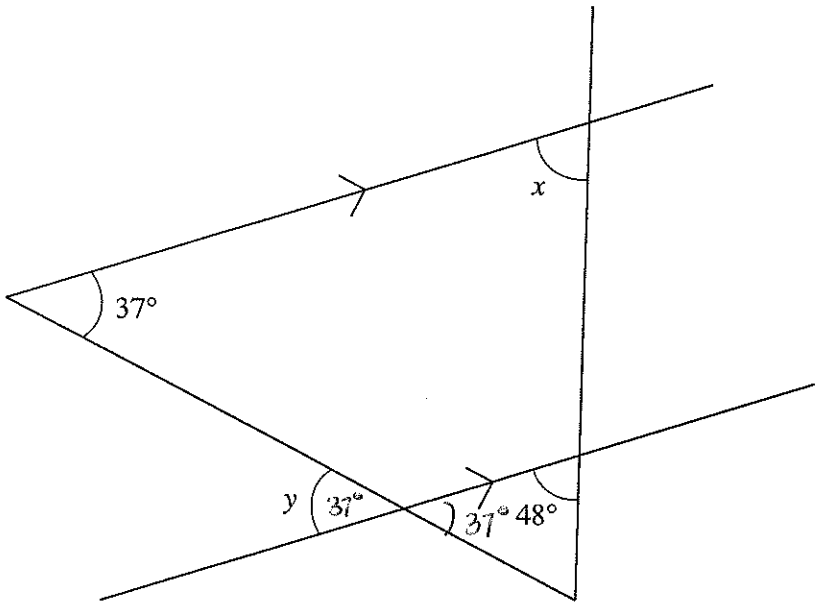


Diagram not drawn to scale.

Find the size of the angles marked x and y in the above diagram.

corresponding alternate

$x =$ 48° $y =$ 37° [2]

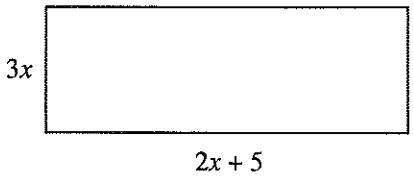
(b) Calculate the size of **each** interior angle of a regular eight-sided polygon.

Each Exterior $= \frac{360}{8} = 45°$

$\therefore$ Each interior $180 - 45$

$= 135°$ [2]

14. *(a)*



The length of a rectangle is $2x + 5$ cm.
The breadth of the rectangle is $3x$ cm.
Find the perimeter of the rectangle in terms of x, giving your answer in its simplest form.

$3x + 3x + 2x + 5 + 2x + 5$

$= 10x + 10$

[2]

(b) Solve $8x + 4 = 7 - 4x$.

$8x + 4x = 7 - 4$

$12x = 3$

$x = \frac{3}{12} = \frac{1}{4}$

[3]

(c) Solve $5(2x - 3) = 50$.

$10x - 15 = 50$

$10x = 65$

$x = \frac{65}{10} = 6.5$

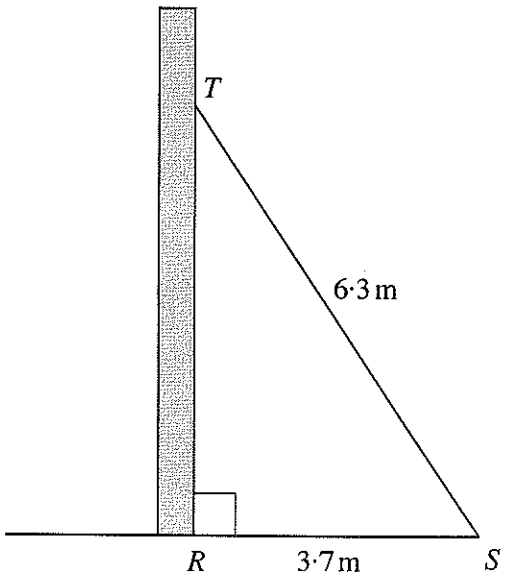
[3]

(d) Factorise $2x^2 - 6x$.

$2x(x - 3)$

[2]

15. A ladder, *ST*, of length 6·3 m rests against a vertical wall. The foot of the ladder *S* is on horizontal ground, 3·7 m from the base of the wall.
Calculate the height, *TR*, of the top of the ladder above the ground, giving your answer to an appropriate degree of accuracy.



$h^2 = a^2 + b^2$

$6.3^2 = 3.7^2 + TR^2$

$39.69 = 13.69 + TR^2$

$39.69 - 13.69 = TR^2$

$26 = TR^2$

$5.1\text{ m} = TR$

[3]

16. The heights of 80 people were measured to the nearest centimetre. The table below shows a grouped frequency distribution of the heights.

Height (h centimetres)	Mid	Number of people
$151 \leqslant h \leqslant 157$	154	18
$158 \leqslant h \leqslant 164$	161	37
$165 \leqslant h \leqslant 171$	168	25

Find an estimate for the mean height of these people.

$$\frac{(18 \times 154) + (37 \times 161) + (25 \times 168)}{80}$$

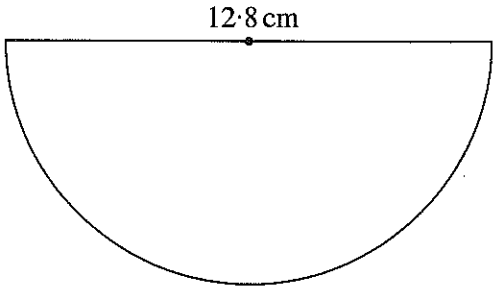
$$= \frac{2772 + 5957 + 4200}{80}$$

$$= \frac{12929}{80}$$

$$= 161.6 \text{ cm}.$$

[4]

17. *(a)* Calculate the area of a semicircle with a diameter of 12·8 cm.

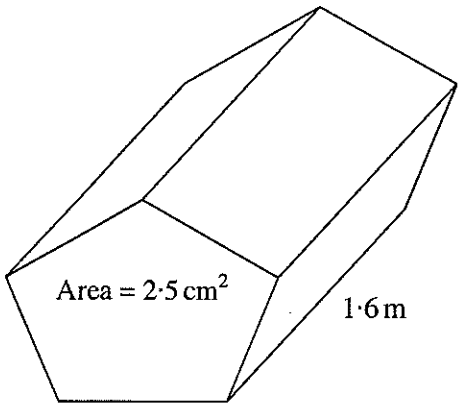


$A = \frac{\pi r^2}{2}$

$A = \frac{3{\cdot}14 \times 6{\cdot}4 \times 6{\cdot}4}{2} = 64{\cdot}31 \text{ cm}^2$

[2]

(b) Calculate the volume of a prism with an area of cross-section 2·5 cm^2 and length 1·6 m, giving your answer in cm^3.



$V = 2{\cdot}5 \times 1{\cdot}6 \times 100$

$V = 400 \text{ cm}^3$

[3]