

Name

Class



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# Trapeziums

(9 – 1) Topic booklet

## Higher

These questions have been collated from previous years GCSE Mathematics papers.

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1H** question you are not allowed to use a calculator.
- If the question is a **2H** or a **3H** question, you may use a calculator to help you answer.

### Information

- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### Advice

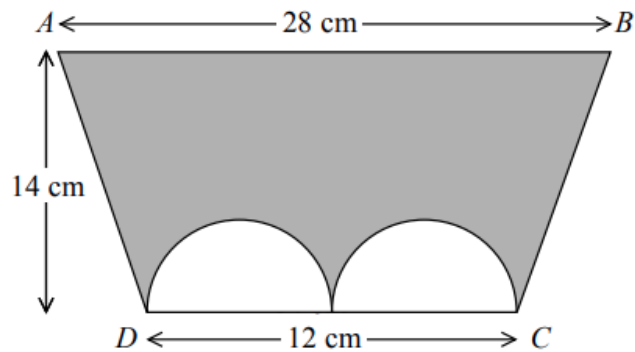
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

**Answer ALL questions**

**Write your answers in the space provided.**

**You must write down all the stages in your working.**

- 1** The diagram shows a trapezium  $ABCD$  and two identical semicircles.



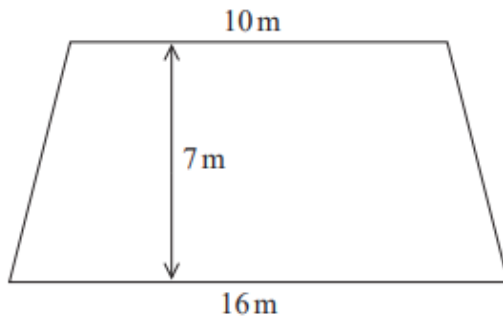
The centre of each semicircle is on  $DC$ .

Work out the area of the shaded region.

Give your answer correct to 3 significant figures.

.....  $\text{cm}^2$

- 5 The diagram shows a floor in the shape of a trapezium.



John is going to paint the floor.

Each 5 litre tin of paint costs £16.99

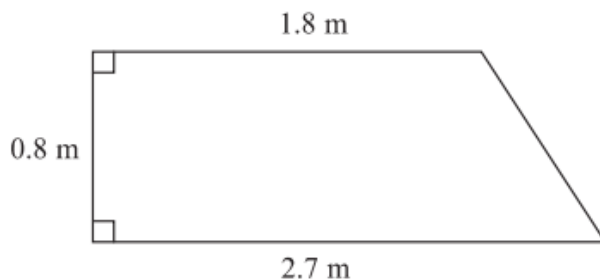
1 litre of paint covers an area of  $2\text{ m}^2$

John has £160 to spend on paint.

Has John got enough money to buy all the paint he needs?

You must show how you get your answer.

- 5 The diagram shows a wall in the shape of a trapezium.



Karen is going to cover this part of the wall with tiles.  
Each tile is rectangular, 15 cm by 7.5 cm

Tiles are sold in packs.  
There are 9 tiles in each pack.

Karen divides the area of this wall by the area of a tile to work out an estimate for the number of tiles she needs to buy.

- (a) Use Karen's method to work out the estimate for the number of packs of tiles she needs to buy.

.....  
(5)

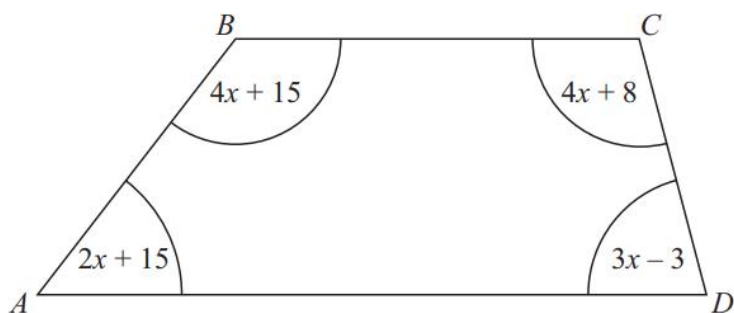
Karen is advised to buy 10% more tiles than she estimated.  
Buying 10% more tiles will affect the number of the tiles Karen needs to buy.

She assumes she will need to buy 10% more packs of tiles.

- (b) Is Karen's assumption correct?  
You must show your working.

(2)

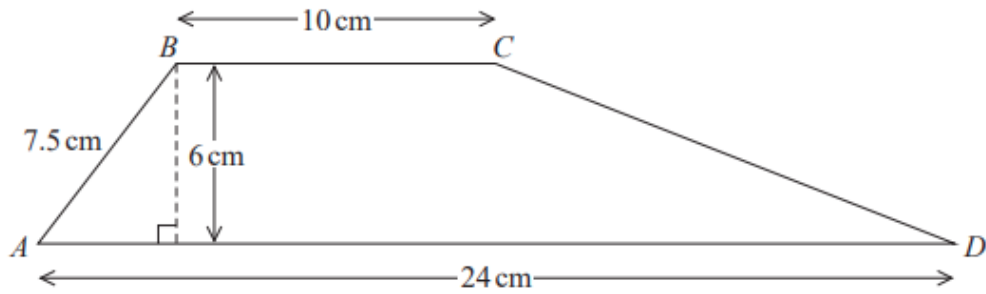
7  $ABCD$  is a quadrilateral.



All angles are measured in degrees.

Show that  $ABCD$  is a trapezium.

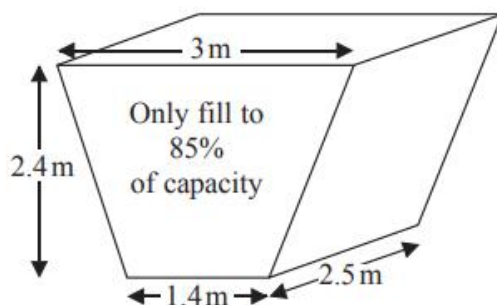
7  $ABCD$  is a trapezium.



Work out the size of angle  $CDA$ .

Give your answer correct to 1 decimal place.

- 8 The diagram shows an oil tank in the shape of a prism.  
The cross section of the prism is a trapezium.



The tank is empty.

Oil flows into the tank.

After one minute there are 300 litres of oil in the tank.

Assume that oil continues to flow into the tank at this rate.

- (a) Work out how many **more** minutes it takes for the tank to be 85% full of oil.  
( $1 \text{ m}^3 = 1000 \text{ litres}$ )

..... minutes

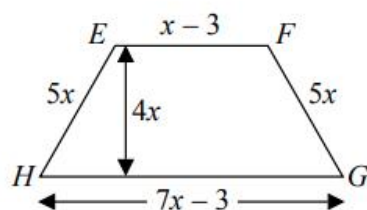
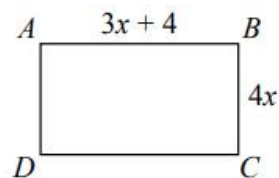
(5)

The assumption about the rate of flow of the oil could be wrong.

- (b) Explain how this could affect your answer to part (a).

.....  
.....  
(1)

- 9  $ABCD$  is a rectangle.  
 $EFGH$  is a trapezium.

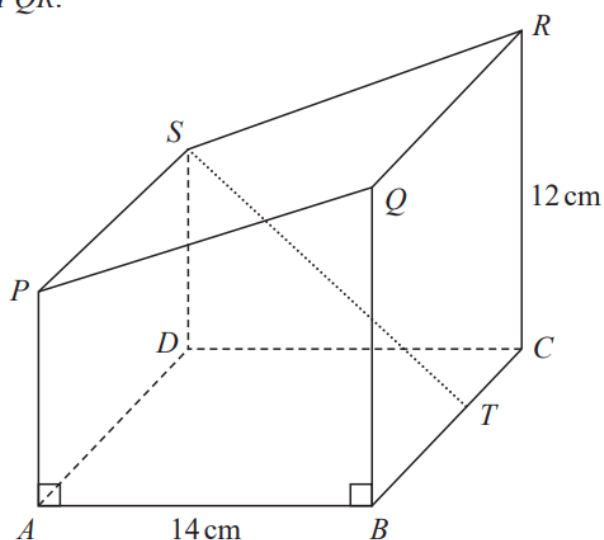


All measurements are in centimetres.  
 The perimeters of these two shapes are the same.

Work out the area of the rectangle.

.....  $\text{cm}^2$

18 Here is a prism  $ABCDSPQR$ .



The base  $ABCD$  of the prism is a square of side  $14\text{ cm}$

$T$  is the point on  $BC$  such that  $BT : TC = 4 : 3$

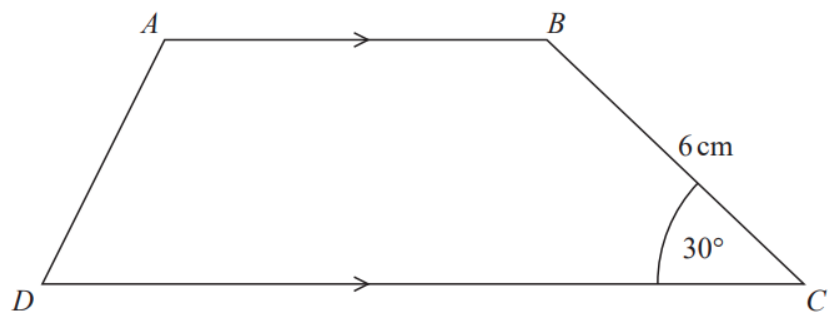
The cross section of the prism is in the shape of a trapezium of area  $147\text{ cm}^2$

$CR = 12\text{ cm}$

Find the size of the angle between the line  $ST$  and the base  $ABCD$ .

Give your answer correct to 1 decimal place.

18 Here is trapezium  $ABCD$ .



The area of the trapezium is  $66\text{ cm}^2$   
the length of  $AB$  : the length of  $CD = 2 : 3$   
Find the length of  $AB$ .

..... cm