

# UNITS 1 – 3

## Miscellaneous Exercises



### Note

Starred\* questions are for *Academic Route* only.

1. The winning numbers in the National Lottery one week were

49  
36  
46  
39  
23  
7

Write down the numbers in order of size. Put the smallest one first.

(LON)

2. Write down two different pairs of numbers that multiply together to make 24.

(LON)

- 3.

Ways of getting 192	Ways of getting 272
$12 \times 16 = 192$	$17 \times 16 = 272$
$24 \times 8 = 192$	$34 \times \dots = 272$
$48 \times 4 = 192$	$68 \times \dots = 272$
$86 \times 2 = 192$	$\dots \times \dots = 272$

(LON)

\*

- 4.

Continent	Population	Area (m <sup>2</sup> )
Europe	$6.82 \times 10^8$	$1.05 \times 10^{10}$
Asia	$2.96 \times 10^9$	$4.35 \times 10^{10}$

$$\text{Population density} = \frac{\text{Population}}{\text{Area}}$$

Which of these two continents has the larger population density?

*You must show all your working.*

(SEG)

5. The cost of hiring a car can be calculated by using the formula

$$\text{Cost} = 25d + \frac{12(m - 50d)}{100}$$

where  $d$  is the number of days the car is hired and  $m$  is the number of miles the car is driven.

A car is hired for 7 days and driven 476 miles.

Calculate the total cost of the car hire.

(SEG)

6. The temperature inside a fridge is  $3^{\circ}\text{C}$ .  
The temperature inside a freezer is  $-18^{\circ}\text{C}$ .

(a) How much colder is it inside the freezer than inside the fridge?

(b) The formula  $F = \frac{9C}{5} + 32$  is used to convert  $^{\circ}\text{C}$  to  $^{\circ}\text{F}$ .

Calculate the temperature inside the freezer in  $^{\circ}\text{F}$ .

(c) The temperature inside the freezer has been recorded to the nearest degree.  
What is the minimum temperature inside the freezer in  $^{\circ}\text{C}$ ?

(SEG)

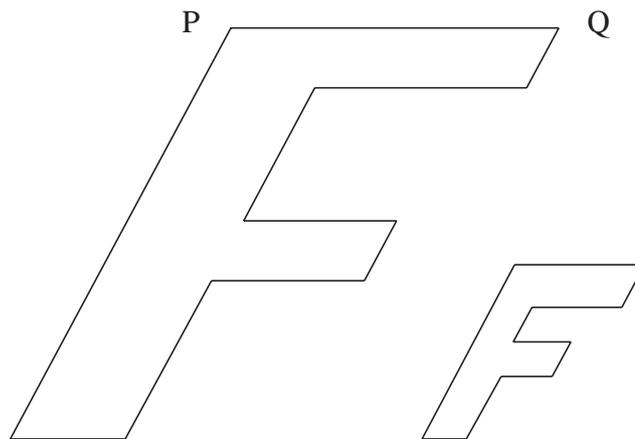
- \* 7. The periodic time,  $T$  seconds, of a simple pendulum, of length  $l$  metres, is given by

$$T = 2.006 \times \sqrt{l}.$$

When  $l = 1.44 \times 10^{-2}$  m, calculate the periodic time to the nearest hundredth of a second.

(SEG)

- 8.

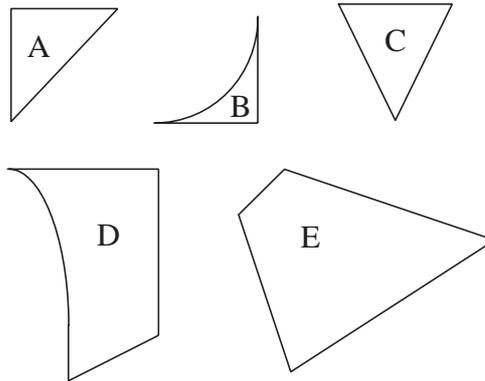


PQ is a horizontal line. Copy the diagram above and mark on your drawing:

- (a) a different horizontal line with a letter H,  
(b) an acute angle with a letter A,  
(c) an obtuse angle with a letter O.

(LON)

9. Here are five shapes.

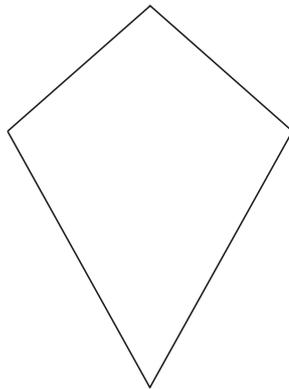


- (a) Write down the letters of the shapes that have a right angle.
- (b) In which way are shapes B and D different from shapes A, C and E?

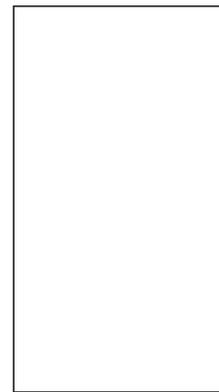
(LON)

10 Copy and draw in all the lines of symmetry for each of these shapes.

(a)

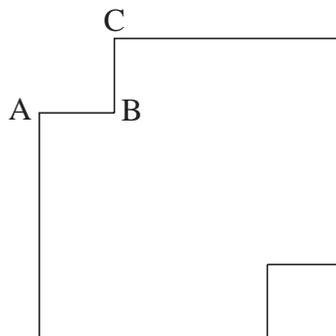


(b)



(LON)

11. This shape is formed from two overlapping squares with  $AB = BC$  and angle  $ABC = 90^\circ$ .



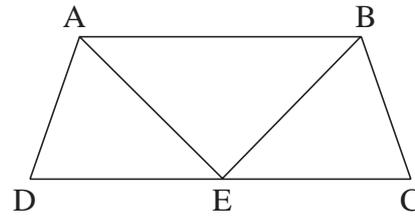
*Not to scale*

- (a) The shape has line symmetry. Draw the shape and its lines of symmetry.
- (b) The shape has rotational symmetry.  
What is the order of rotational symmetry?

(SEG)

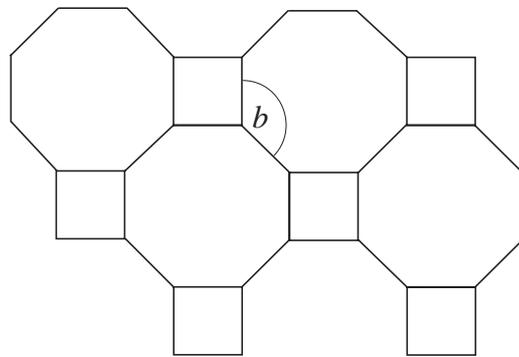
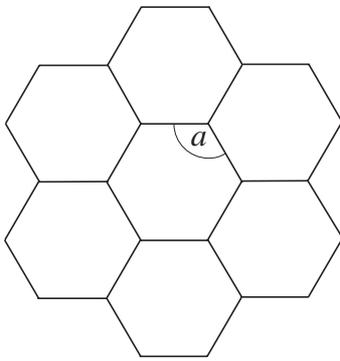
- \* 12. (a) Three triangles are placed together to form a quadrilateral, as shown.

$AB$  is parallel to  $DC$ .  
 $BC = AD$  and  $AE = EB$ .  
 $E$  is the mid-point of  $DC$ .



Name two angles which are the same size as angle  $BAE$ , giving a reason for each of your answers.

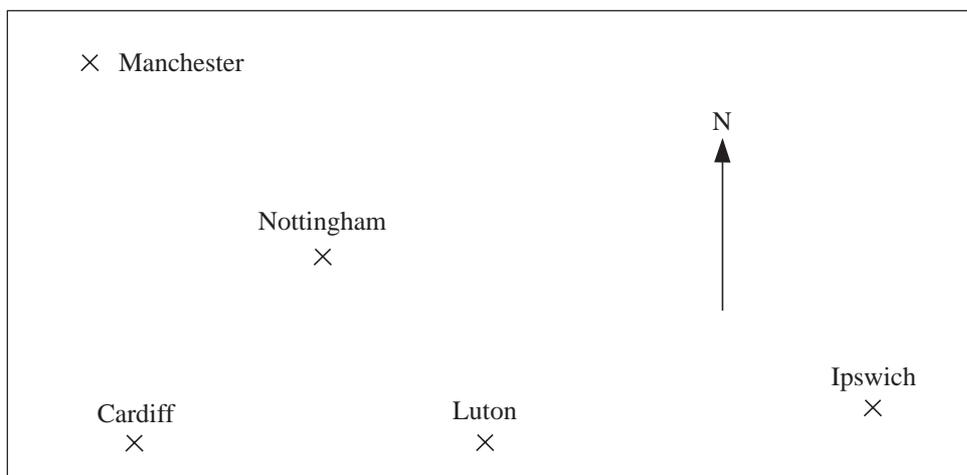
- (b) These tiling patterns have been made using regular polygons.



- (i) Work out the size of the angles marked  $a$  and  $b$ .  
 (ii) Explain why a tiling pattern cannot be made with only regular pentagons.

(SEG)

- 13.



The diagram is part of a map showing the positions of several towns.  
 Measure and write down the bearing of Manchester from Nottingham.

(LON)