

Congruent shapes

Year 7 About 60 minutes No calculator 46 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-congruent-shapes/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] **A2** Needed today [1 mark]
- Three angles of a quadrilateral are 85° , 95° and 110° . Work out the fourth angle.
- How many lines of symmetry does a rectangle that is not a square have?

Answer

Answer

- A3** Last lesson [1 mark] **A4** From chapter 3 [1 mark]
- A price falls from £50 to £40. Work out the percentage decrease.
- The probability that a spinner lands on 4 is 0.35. Work out the probability that it does not land on 4.

Answer

Answer

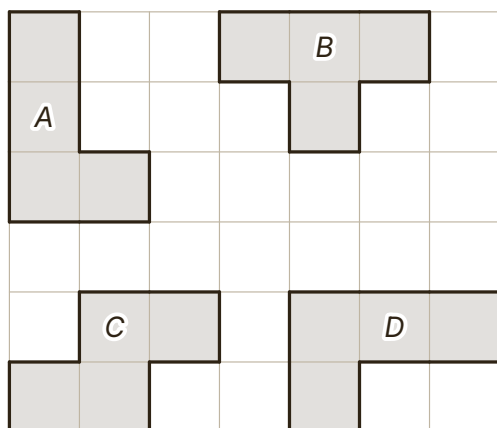
B Example, then your turn

Year 7

Your teacher works through each example with you. Then try the one beside it.

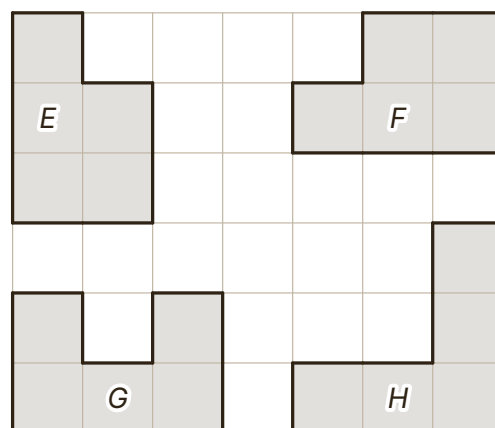
EXAMPLE 1

Which two of the shapes *A*, *B*, *C* and *D* are congruent?



Hint Congruent shapes have the same shape and the same size. A shape can be turned or flipped over and still be congruent.

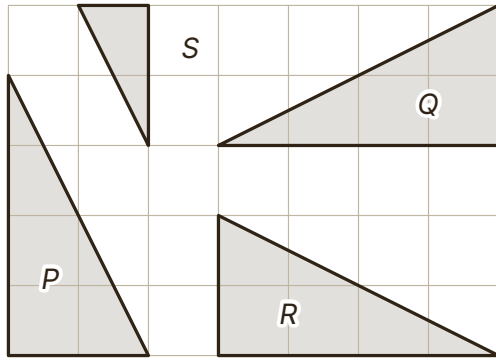
- B1** Which two of the shapes *E*, *F*, *G* and *H* are congruent? Give a reason. [2 marks]



Answer

EXAMPLE 2

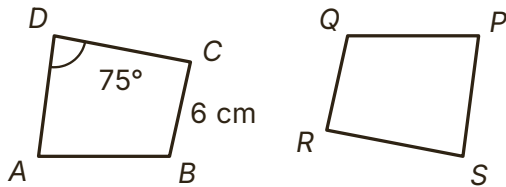
Which triangle is the odd one out? Give a reason.



Hint Look at the two shorter sides of each right-angled triangle.

EXAMPLE 3

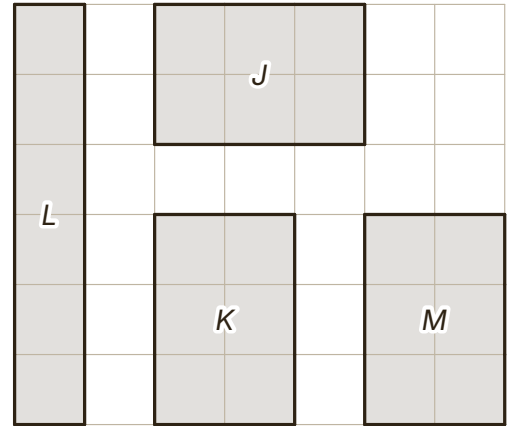
$ABCD$ and $PQRS$ are congruent (A matches P , B matches Q , C matches R , D matches S). Write down the length of QR and the size of angle S .



Not drawn accurately

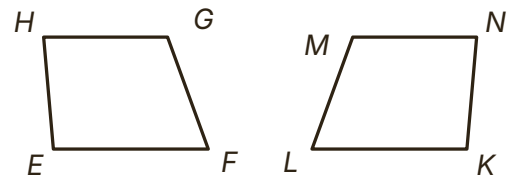
Hint Matching sides are equal and matching angles are equal. Use the order of the letters.

B2 Which shape is the odd one out? Give a reason. [2 marks]



Answer

B3 $EFGH$ and $KLMN$ are congruent (E matches K , F matches L , G matches M , H matches N). $EF = 8$ cm, angle $E = 95^\circ$, angle $F = 70^\circ$, angle $G = 110^\circ$. Write down the length of KL . Work out angle N . [3 marks]



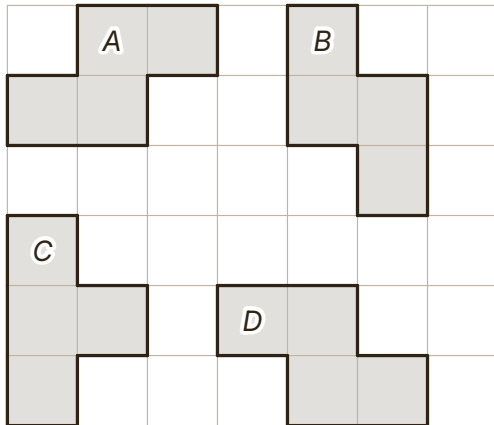
Not drawn accurately

Answer

C Practice

Year 7

- C1** Which of the shapes B , C and D [2 marks]
are congruent to shape A ?

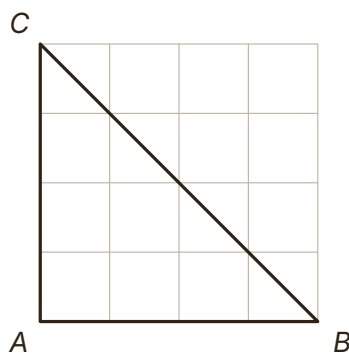


Answer

- C3** Shape Q is an enlargement of shape P with scale factor 3. Are P and Q congruent? Give a reason. [2 marks]

Answer

- C4** On the diagram, draw lines to [2 marks]
split triangle ABC into four
congruent triangles.



- C5** Which of these pairs must be [3 marks]
congruent? (i) two circles that
each have radius 5 cm (ii) two
squares that each have
perimeter 20 cm (iii) two
rectangles that each have
perimeter 20 cm

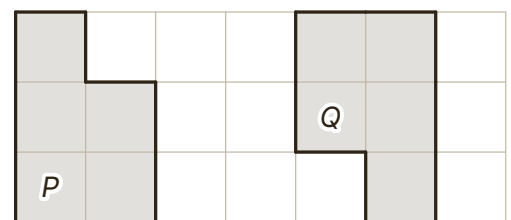
Answer

D Exam-style questions

GCSE Foundation

- D1** Kai says, "Shapes P and Q are not congruent, because Q is upside down." [2 marks]

Is Kai correct? Give a reason for your answer.



D2 The diagram shows a right-angled triangle. Two of these triangles are joined so that two equal sides match exactly.

- (a) The two triangles are joined along their 5 cm sides. One shape that can be made is a rectangle. Write down the name of the other shape that can be made. [1 mark]

Answer

- (b) Work out the perimeter of the rectangle. [2 marks]

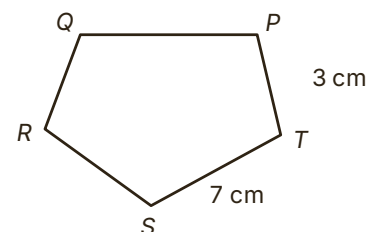
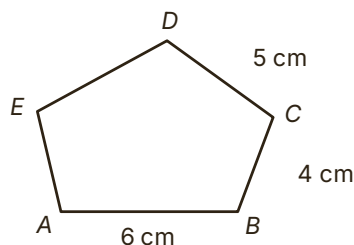
Answer

- (c) The two triangles are now joined along their 4 cm sides to make an isosceles triangle. Work out the perimeter of the isosceles triangle. [2 marks]

Answer

Total for D2: 5 marks

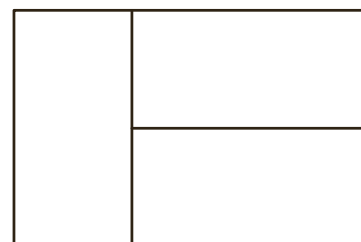
- D3** Pentagons $ABCDE$ and $PQRST$ are congruent. A matches P , B matches Q , C matches R , D matches S and E matches T . Work out the perimeter of pentagon $ABCDE$. You must show your working. [4 marks]



Answer

Not drawn accurately

- D4** The large rectangle in the diagram is made from three congruent rectangles. The perimeter of the large rectangle is 60 cm. Work out the area of one of the small rectangles. You must show your working. [5 marks]



Answer

D5 *ABCDEF* is a regular hexagon with perimeter 48 cm. It is split into six congruent equilateral triangles.

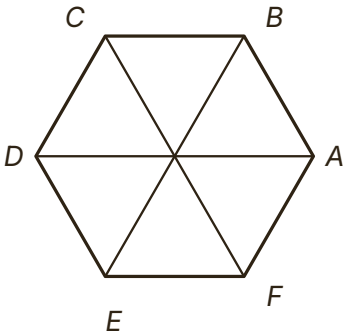
(a) Work out the perimeter of one of the triangles. [2 marks]

Answer

(b) The hexagon is cut along *AD* into two congruent pieces. Work out the perimeter of one piece. [3 marks]

Answer

Total for D5: 5 marks

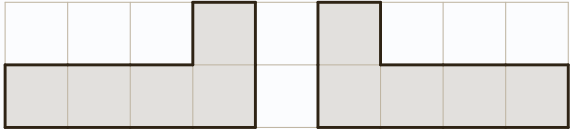


E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

E1 Shapes are made from 5 equal squares joined edge to edge. Two shapes count [5 marks] as the same if they are congruent, like the two shapes in the diagram. How many different shapes can be made?



Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1

Hint 1

Start with all 5 squares in a line. Then try 4 in a line and move the fifth square, then 3 in a line, and so on.
- Hint 2

With 4 in a line there are only two different shapes. Flip and turn each new shape to check it is not one you already have.
- Hint 3

Sort by the longest line of squares: a line of 5 gives 1 shape, 4 gives 2, 3 gives 8 and 2 gives 1. That is $1 + 2 + 8 + 1 = 12$.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

- I can decide whether two shapes are congruent.
- I know a reflected or rotated shape is congruent to the original.
- I can find matching sides and angles in congruent shapes.
- I can split a shape into congruent pieces.