

<b>Student Name:</b> _____	<b>Grade:</b> _____
<b>Date:</b> _____	<b>Score:</b> _____

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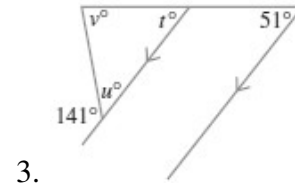
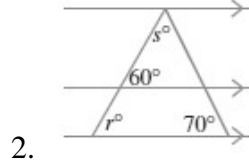
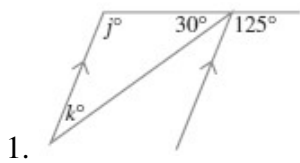
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# 7 Year 7 Term 3 Week 7 Homework

## 7.1 Properties of geometrical figures

### 7.1.1 Angle sum of a triangle

Exercise 7.1.1 Find the value of each pronumeral:

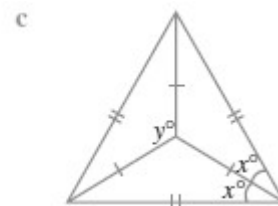
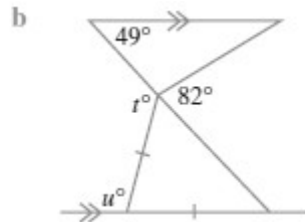
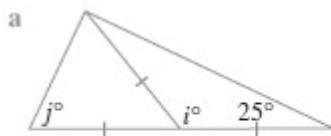


1.  $j =$  \_\_\_\_\_ ;  $k =$  \_\_\_\_\_

2.  $r =$  \_\_\_\_\_ ;  $s =$  \_\_\_\_\_

3.  $t =$  \_\_\_\_\_ ;  $u =$  \_\_\_\_\_ ;  $v =$  \_\_\_\_\_

Exercise 7.1.2 Find the value of the pronumeral(s) in each of the following:



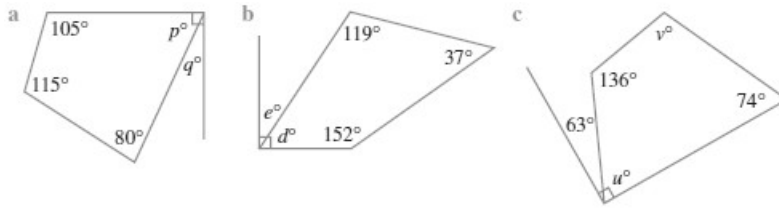
a.  $i =$  \_\_\_\_\_ ;  $j =$  \_\_\_\_\_

b.  $t =$  \_\_\_\_\_ ;  $u =$  \_\_\_\_\_

c.  $x =$  \_\_\_\_\_ ;  $y =$  \_\_\_\_\_

**7.1.2 Angle sum of a quadrilateral**

**Exercise 7.1.3 Find the values of all the pronumerals in each of these:**

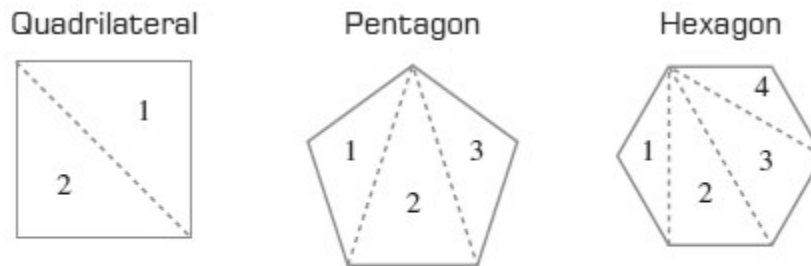


a.  $p =$  \_\_\_\_\_ ;  $q =$  \_\_\_\_\_

b.  $e =$  \_\_\_\_\_ ;  $d =$  \_\_\_\_\_

c.  $u =$  \_\_\_\_\_ ;  $v =$  \_\_\_\_\_

**Exercise 7.1.4 Complete the table shown below and hence find the rule will give you the angle sum of any polygon.**



Polygon	Number of sides	Number of triangles	Angle sum
Quadrilateral	4	2	$2 \times 180 = 360^\circ$
Pentagon	5	3	$3 \times 180 = 540^\circ$
Hexagon	6	4	$4 \times 180 =$
Heptagon	7	...	...
Octagon	8	...	...
Nonagon	9	...	...
Decagon	10	...	...
Dodecagon	12	...	...
	50		
	100		
	$n$		

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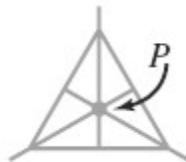
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**7.1.3 Symmetry**

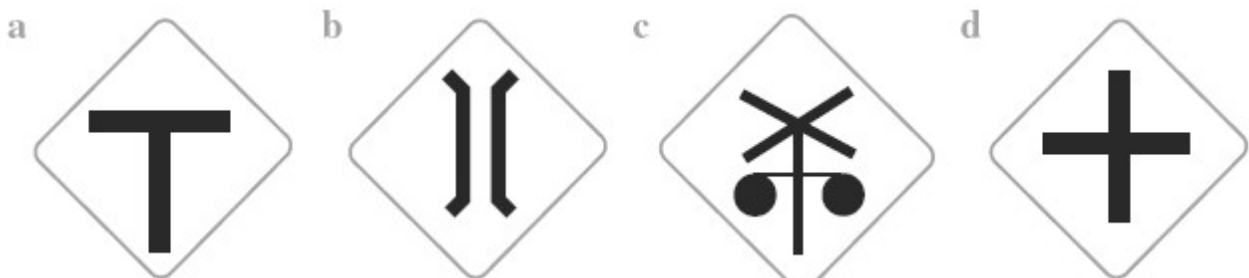
- A figure has line symmetry if a line can be drawn through the figure dividing it into two parts, such that each part is the mirror image of the other.
- A figure has rotational symmetry if it can be rotated or turned about a fixed point through an angle of  $180^\circ$  or less so as to look identical.
- The point about which the figure is rotated is called the centre of symmetry.
- The number of times that the figure can be rotated onto itself in one complete revolution is called the order of symmetry.
- The figure shown below can be rotated onto itself three times in one complete revolution about the point  $p$ . Therefore the figure has rotational symmetry of order 3.



**Exercise 7.1.5 How many axes of symmetry does each of the following shapes have:**

1. an isosceles triangle \_\_\_\_\_
2. a rhombus \_\_\_\_\_
3. a kite \_\_\_\_\_
4. a regular hexagon \_\_\_\_\_
5. a circle \_\_\_\_\_

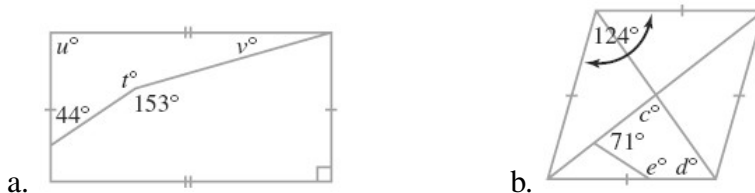
**Exercise 7.1.6 How many axes of symmetry do each of these road signs have?**



- a. \_\_\_\_\_, b. \_\_\_\_\_, c. \_\_\_\_\_, d. \_\_\_\_\_

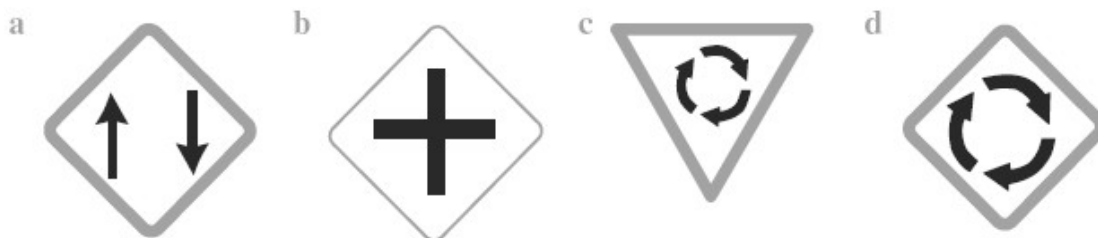
### 7.2 Miscellaneous exercises

**Exercise 7.2.1** Use the properties of the special quadrilaterals to find the pronumerals in each of the figures:



1.  $t =$  \_\_\_\_\_ ;  $u =$  \_\_\_\_\_ ;  $v =$  \_\_\_\_\_
2.  $c =$  \_\_\_\_\_ ;  $d =$  \_\_\_\_\_ ;  $e =$  \_\_\_\_\_

**Exercise 7.2.2** What is the order of rotational symmetry of these road signs?



- a. \_\_\_\_\_ , b. \_\_\_\_\_ , c. \_\_\_\_\_ , d. \_\_\_\_\_

**Exercise 7.2.3**

1. Complete the following table.

Shape	Number of sides	Order of symmetry
equilateral triangle		
square		
regular pentagon		
regular hexagon		

2. What relationship can you see between the number of sides and the order of rotational symmetry in a regular polygon?

\_\_\_\_\_

\_\_\_\_\_

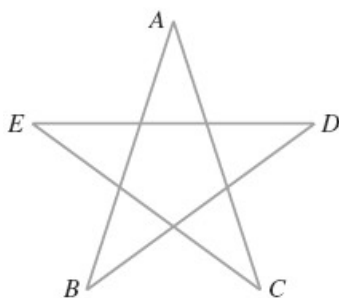
3. What would be the order of symmetry of a regular decagon?

\_\_\_\_\_

\_\_\_\_\_

**Exercise 7.2.4**

1. The figure shown below is a 5-pointed star with five 'pointed' angles equal. What will be the size of each angle? This shape is called a pentagram and was the secret symbol of the followers of Pythagoras. They drew the symbol on the palms of their hands and showed it to gain entry to the secret meeting.




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2. Can you draw a regular 6-pointed star? What will be size of the angles this time?

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3. Is it possible for:

(a) an equilateral triangle to be obtuse? \_\_\_\_\_

(b) an isosceles triangle to be right angled? \_\_\_\_\_

(c) a triangle to have both an obtuse angle and a right angle? \_\_\_\_\_

4. How many axes of symmetry are there in:

(a) an equilateral triangle? \_\_\_\_\_

(b) an isosceles triangle? \_\_\_\_\_

(c) a scalene triangle? \_\_\_\_\_

**Exercise 7.2.5**

1. Which of the special quadrilateral have rotational symmetry? For those that have, state the order of symmetry.

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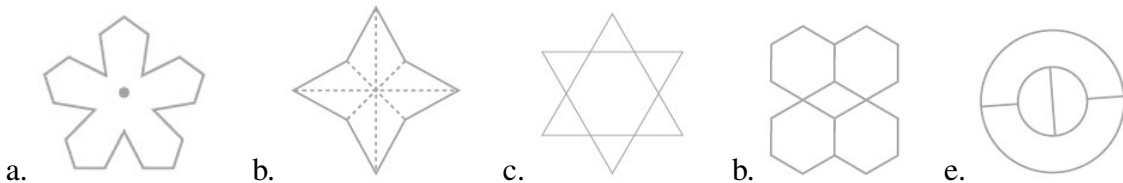


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2. A figure has point symmetry if it looks exactly the same after a rotation of  $180^\circ$  (half turn). State whether each of the following figure has point symmetry.



a. \_\_\_\_\_; b. \_\_\_\_\_; c. \_\_\_\_\_; d. \_\_\_\_\_; e. \_\_\_\_\_;

3. My computer screen displays up to eighty characters on each line. If there is not enough room for a word or a number at the end of a line, the whole word is moved to start at the beginning of the next line. I type (in figures) the numbers from 1 to 100, with a space after each number. what is the last number to appear on the first line?

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4. Sharon should have divided a number by 4, but instead she subtracted 4. She got the answer 48. What should her answer have been?

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5. Think of any whole number. Double it and add five. Double this answer and then add two. Now take away the number first thought of. Then, no matter which number you start with, you answer will always be:

- A. even    B. a multiple of 3    C. a multiple of 5    D. a multiple of 6    E. odd

### 7.3 Maths challenge

#### Exercise 7.3.1

1.  $\frac{1}{3}$  is called the reciprocal of 3. Find the sum of the reciprocals of all the factors of 24.

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2. Which is the smallest prime number among the following?

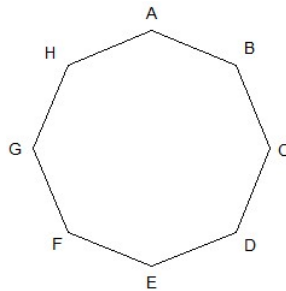
A. 147      B. 157      C. 167      D. 177      E. 187

3. Using exactly 24 identical small cubes you can make a cuboid. How many difference cuboids can you make by using all 24 identical small cubes each time?

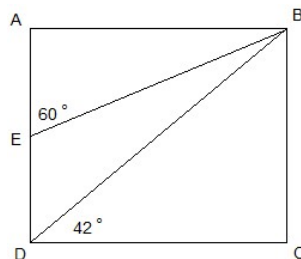
A. 2      B. 3      C. 4      D. 5      E. 6

4. ABCDEFGH is a regular octagon. which triangle has the largest area?

A. ABC      B. CDF      C. EFG      D. DEH      E. EGB



5. ABCD is a rectangle. How big is angle DBE?



A.  $12^\circ$       B.  $18^\circ$       C.  $42^\circ$       D.  $48^\circ$       E.  $60^\circ$

6. You roll two ordinary dice. What is the probability that neither face shows a prime number?

A.  $\frac{1}{9}$       B.  $\frac{1}{4}$       C.  $\frac{4}{9}$       D.  $\frac{3}{4}$       E.  $\frac{9}{16}$