Related DIME Booklets and Worksheets

A rotagram is a deceptively simple tool made from transparent plastic which enables angle concepts to be quickly and easily understood. These concepts are developed in the series of three books and their related worksheets.

Rotagram 1 — *Equal Angles*
Rotagram 1 *Worksheets*
Rotagram 2 — *Rotation*
Rotagram 2 *Worksheets*
Rotagram 3 — *Directions*
Rotagram 3 *Worksheets*

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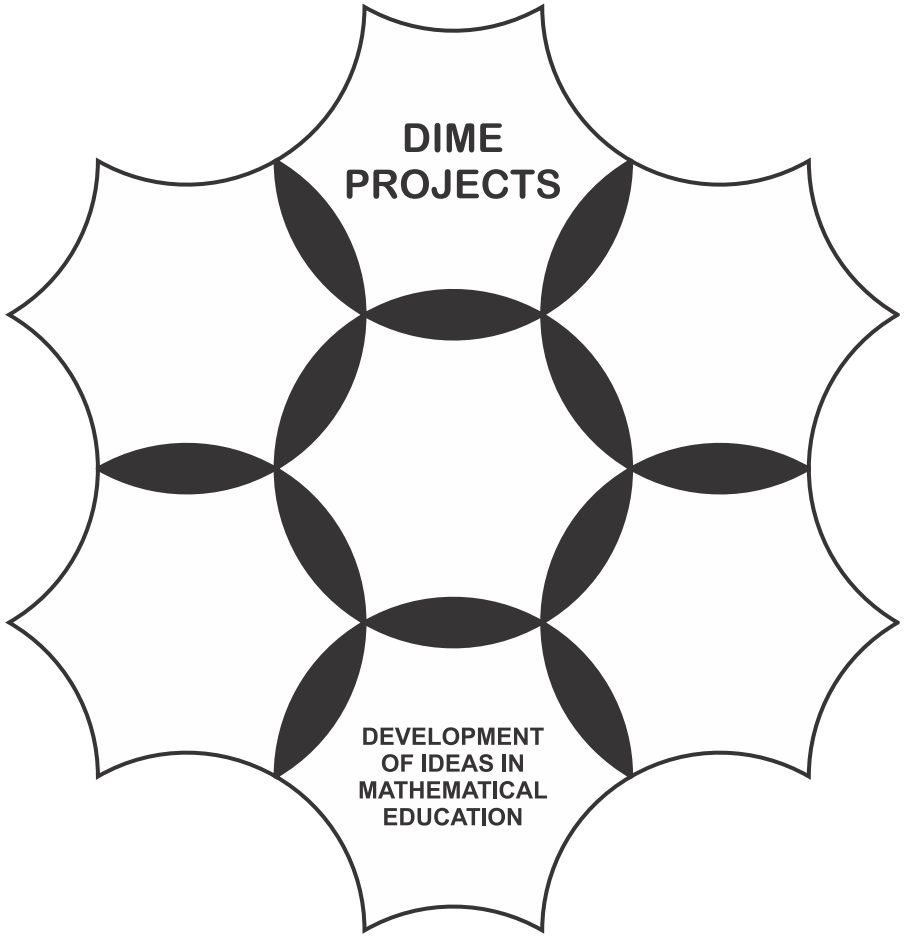
MATHEMATICS WORKCARD BOOKLET

ROTAGRAM 1 — Equal Angles

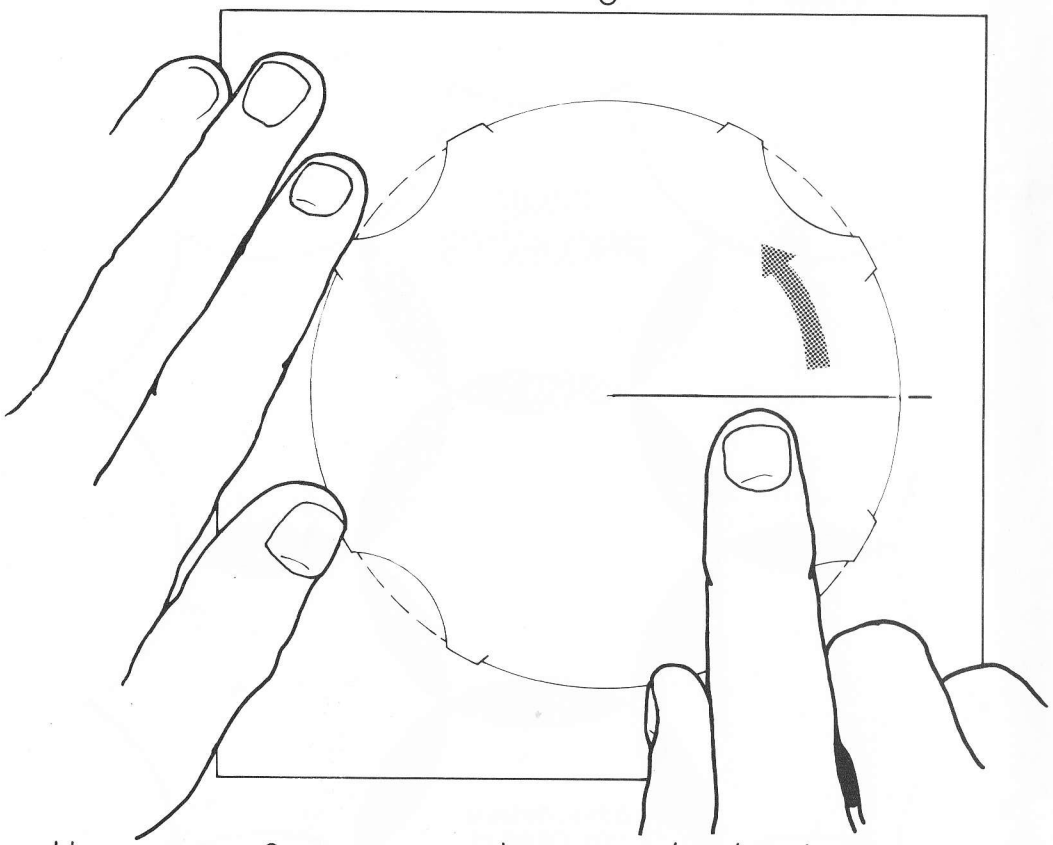
GEOFF GILES



Start here ~

You will need a ROTAGRAM.

Lay it here with the circle on top, and the blue line on top of the black line.



Use one finger on the circle to turn it so that the two lines make an angle.

Rotate the circle further and watch the angle getting bigger.

Before going on you will need a WORKSHEET.

Target test – ADVANCED

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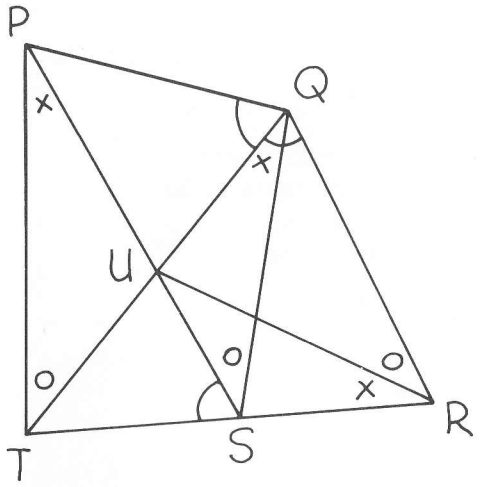


1. The equal angles in this diagram are marked.
Can you name them?

Copy this table and complete it:

$P\hat{Q}U$ = ... = ...

$U\hat{Q}S$ = ... = ...

..... = ... = ...

2. Use your rotagram.

Copy and fill in the numbers:

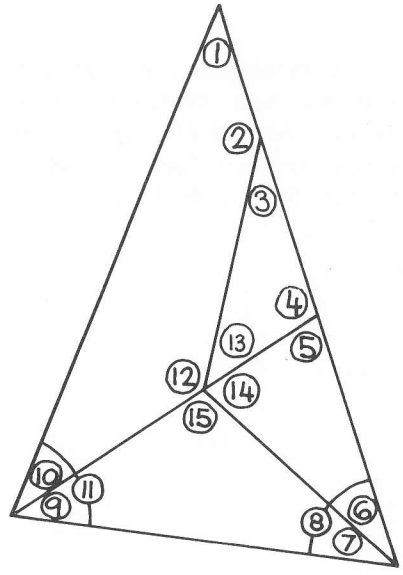
◯=◯=◯

◯=◯

◯=◯

◯=◯

◯=◯



Target test - STANDARD

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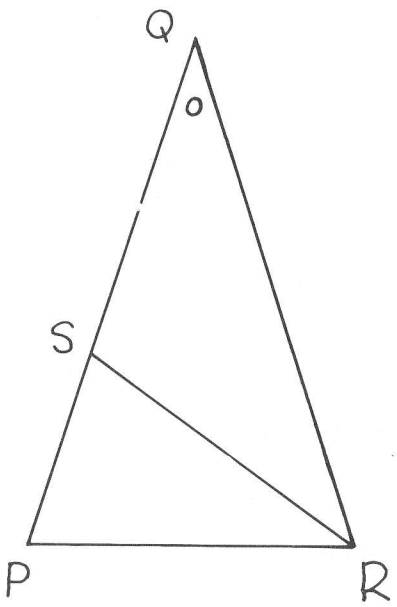


1. Give all four names of the marked angle.

2. Use your rotagram to find equal angles in this diagram.

   Copy and fill in the angles:

   $P\hat{Q}R$ = ... = ...

   ..... = ... = ...

3. Find the equal angles.

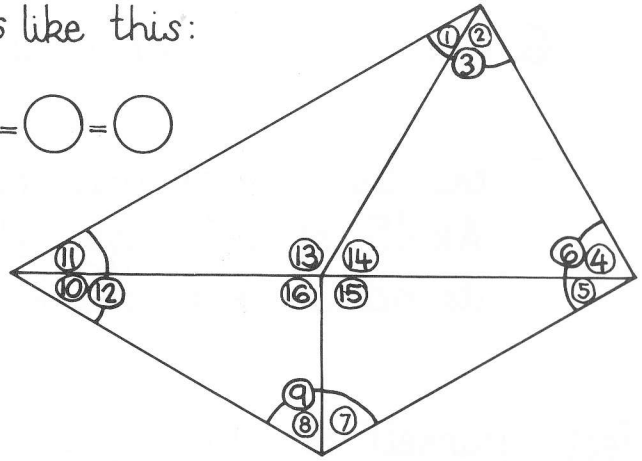
Write your answers like this:

④ = ◯ = ◯ = ◯ = ◯ = ◯

⑤ = ◯ = ◯ = ◯

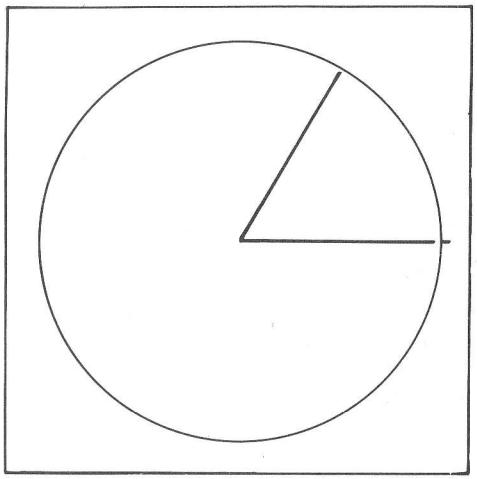
⑥ = ◯ = ◯ = ◯

⑬ = ◯

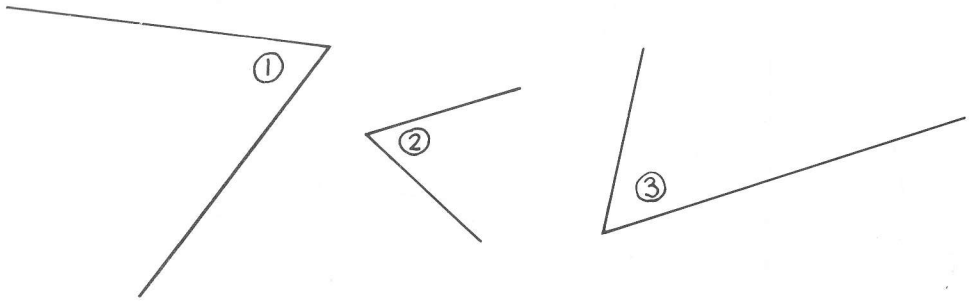


What are equal angles? 1

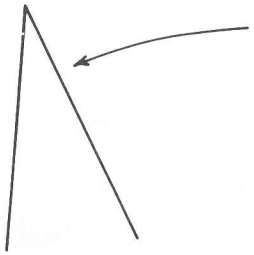
Make your rotagram look like this.



Then it fits these 3 angles:



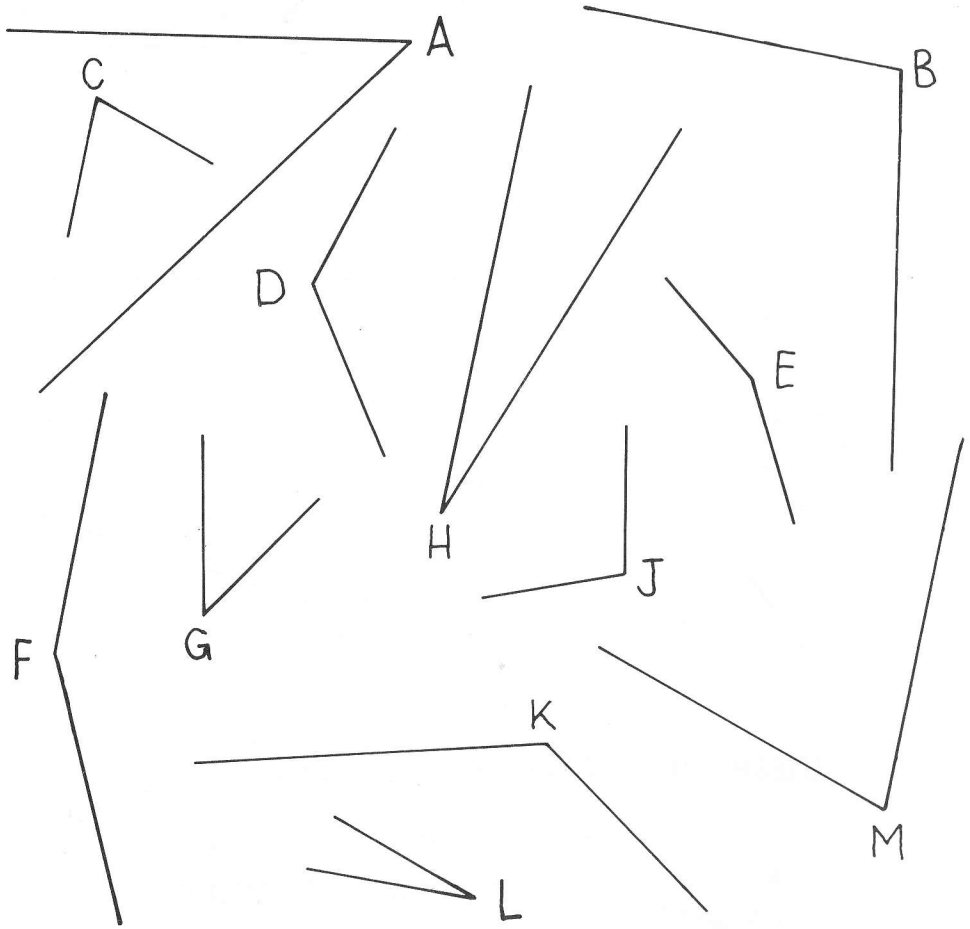
So these are EQUAL ANGLES.



Fit your rotagram to this angle.
Tick the angles on your worksheet that are equal to it.

2 Pairing angles

We name angles by a letter at the corner or VERTEX.
Use your rotagram to check that $\hat{A} = \hat{G}$.
(We read this as "angle A equals angle G.")



Now match the other angles in pairs.
Complete the table on the worksheet.
Don't forget: every angle needs its hat ^.

What have you learnt?

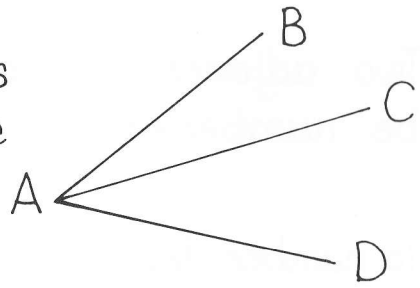
You should now be able to:

1. use the rotagram to find equal angles
2. mark angles in a diagram equal
3. work with numbered angles
4. name angles using letters
5. pick out right angles
6. recognise all three angles here
7. tell the VERTEX and the two ARMS of an angle when told its name, e.g. $S\hat{Q}R$.

Test yourself on the Target Tests.

10 Naming angles

To name adjacent angles we need more than one letter.



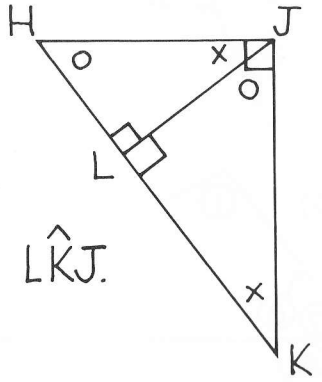
The two sides or <u>ARMS</u> of the top angle are AB and AC.

So we say "angle BAC" (written $B\hat{A}C$).

Note: The <u>VERTEX</u> goes in the middle "under the hat"!

An equally good name for it is $C\hat{A}B$.
The other two angles are $C\hat{A}D$ and $B\hat{A}D$.

In this diagram there are four ways of naming the angle at K:

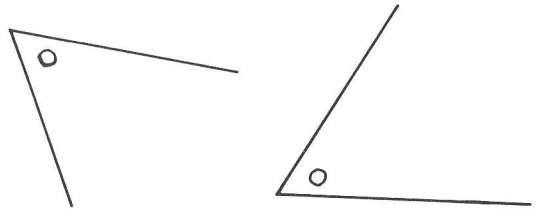


$J\hat{K}L$ or $J\hat{K}H$ or $H\hat{K}J$ or $L\hat{K}J$.

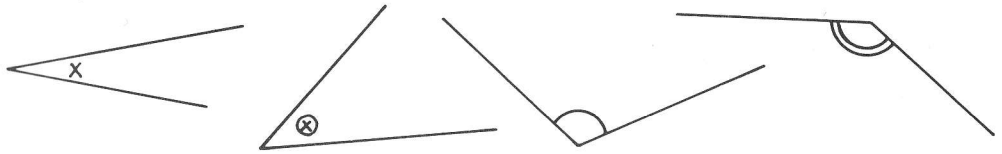
Give the four names of the angle at H and list all the equal angles.

Marking angles equal 3

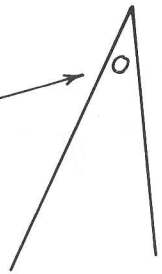
We can show angles are equal by using the same mark:



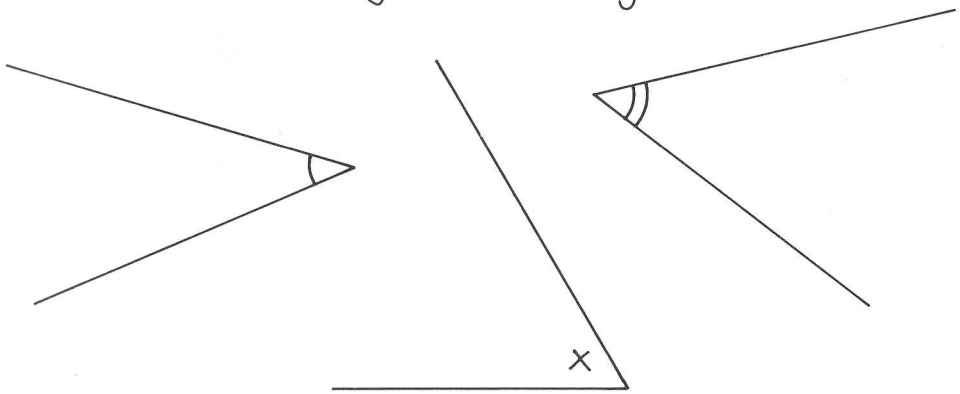
Many other marks can be used:



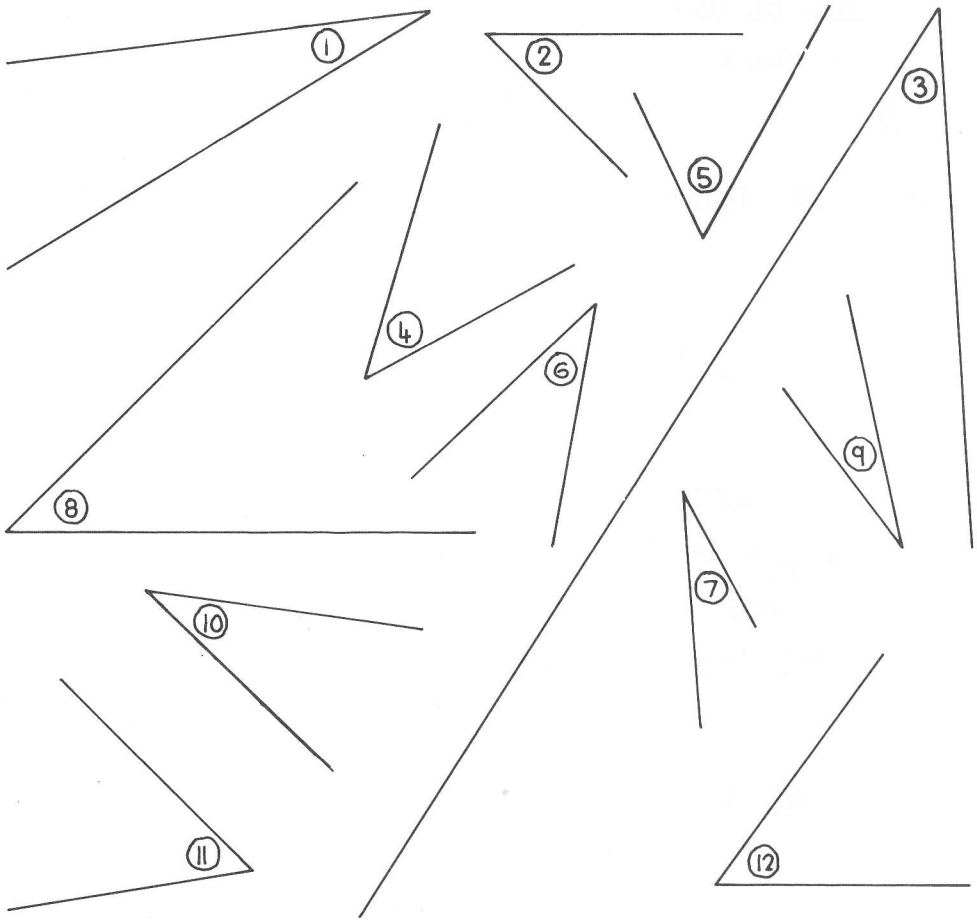
Use your rotagram to find three angles on the worksheet equal to this one. Mark them the same way.



Now do the same for these angles:



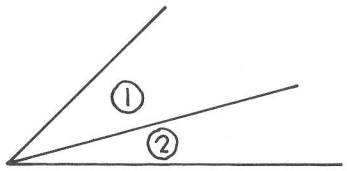
Sometimes it is useful to give angles numbers.



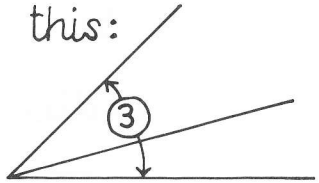
Use your rotagram to check that angles ①, ⑦ and ⑨ are all equal.

Can you fill in the rest of the table on the worksheet?

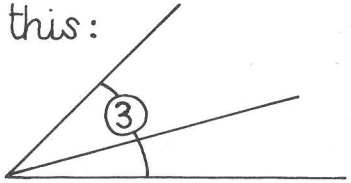
Two adjacent angles can be numbered like this:



To number the third we can do this:

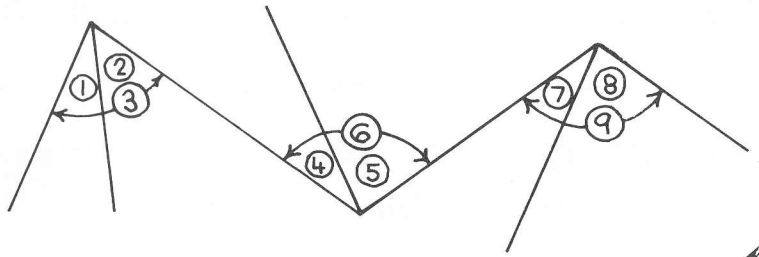


or this:

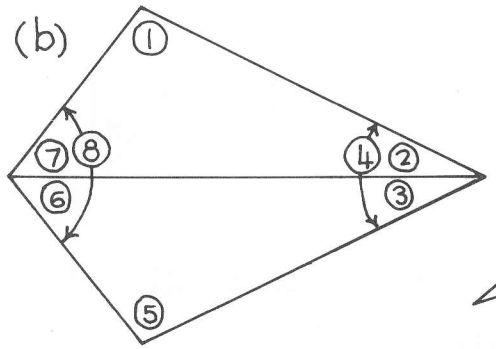


Use your rotagram to find equal angles.
Fill in the tables on the worksheet.

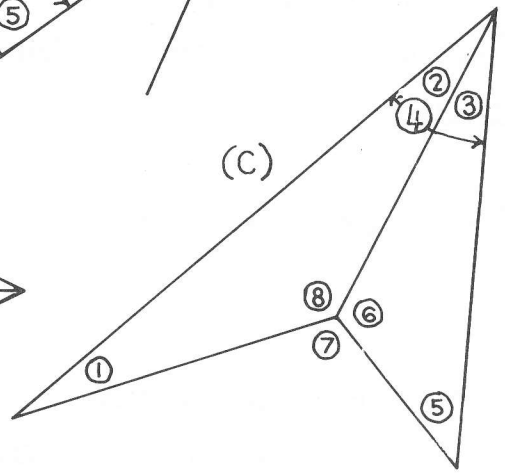
(a)



(b)

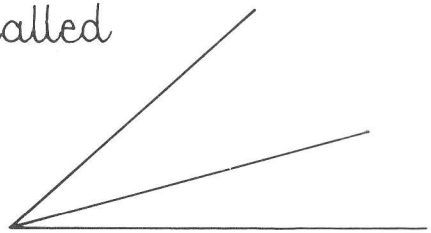


(c)

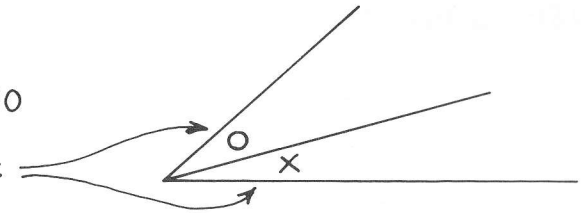


These two angles are called <u>adjacent angles</u>.

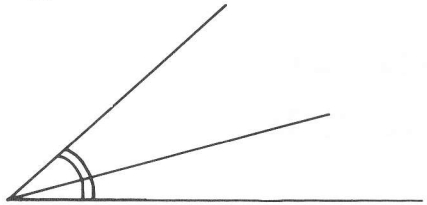
Can you see a <u>third</u> angle?

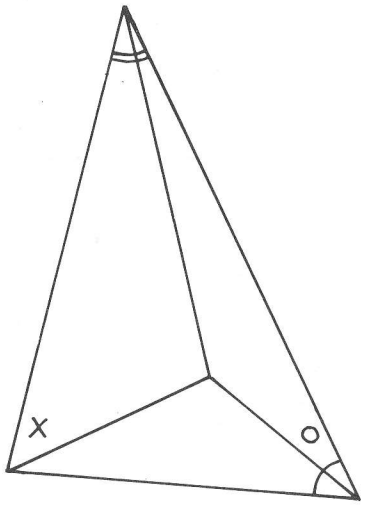


These are the two adjacent angles:



Here the <u>third</u> angle is marked:



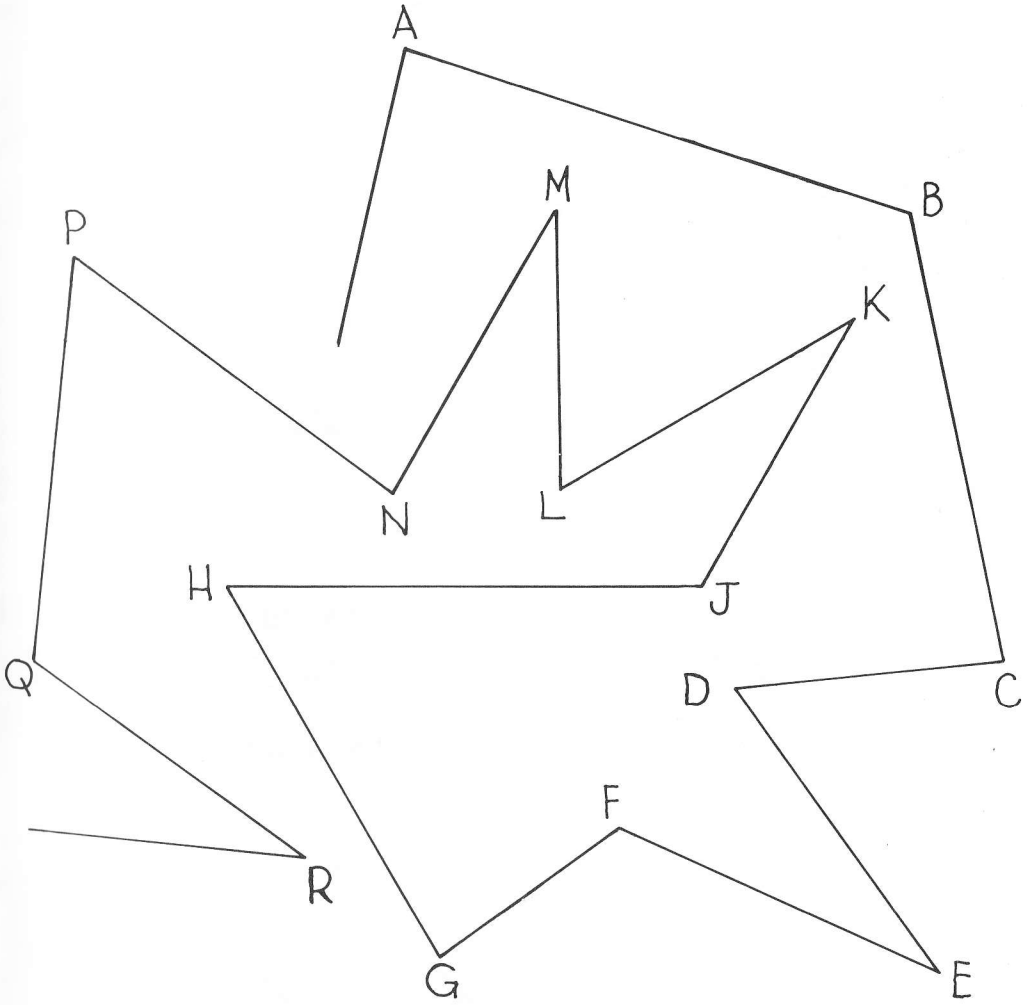


Fit your rotagram to one of the marked angles.

Find an angle equal to it in the diagram on the worksheet. Mark it equal.

Now do the same with the other three marked angles.

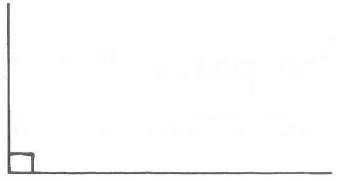
Find the points H and L in this diagram.
Use your rotagram to check that $\hat{H} = \hat{L}$.



Lots of angles are equal.
Fill in the table on the worksheet.
Remember to put on the hats!

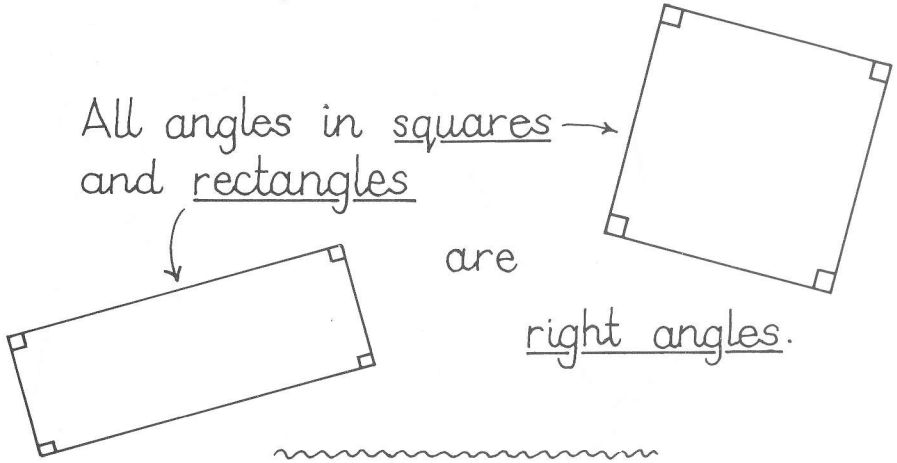
Right angles

This angle is a right angle.



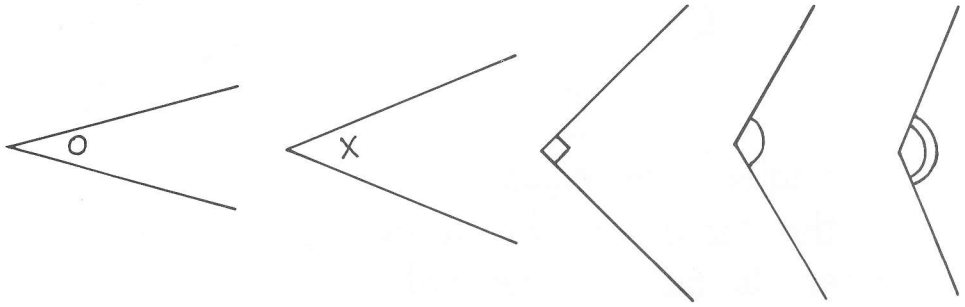
(Notice the special mark.)

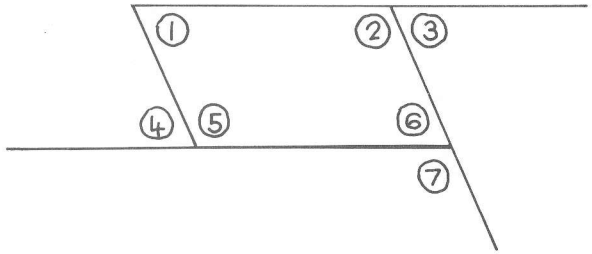
All angles in squares and rectangles



are right angles.

1. In the six shapes on your worksheet there are 9 right angles. How many can you find?
2. Use your rotagram and mark each angle that equals one of these:





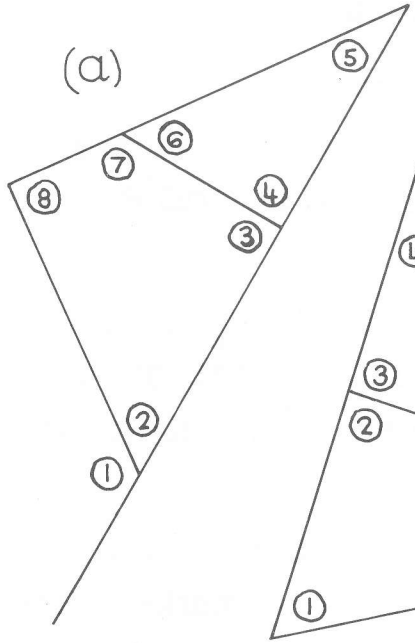
Use your rotagram to check that:

(1) = (3) = (4) = (6)

(2) = (5) = (7)

Now use your rotagram on these diagrams. Fill in the table on the worksheet.

(a)



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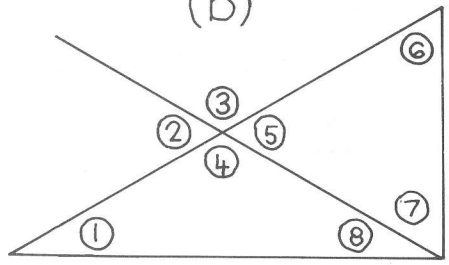
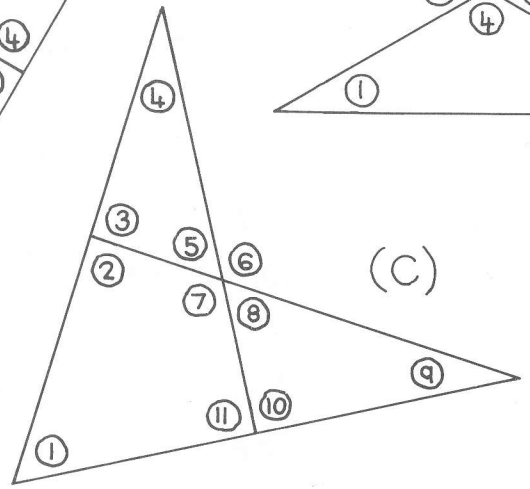
(c)