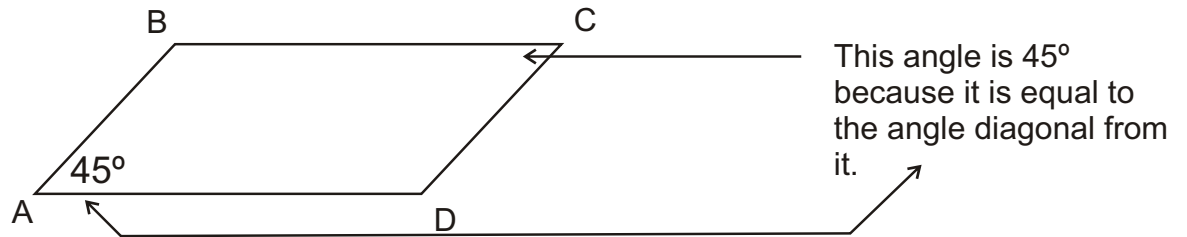


# The Many Degrees Of *Parallelograms*

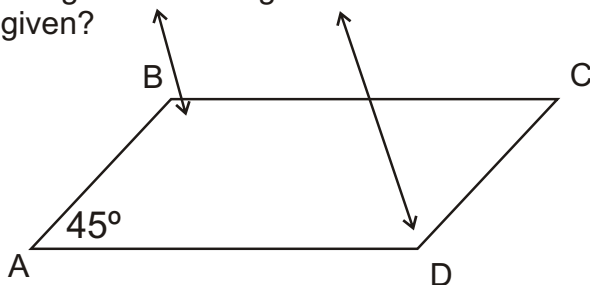
When only one angle of a parallelogram is given, it is still possible to find the remaining three angle measurements of the parallelogram. We can find the other angles because of rules that all parallelograms have.

The first rule is that the two angles which are diagonal from each other are the same degree measurement.

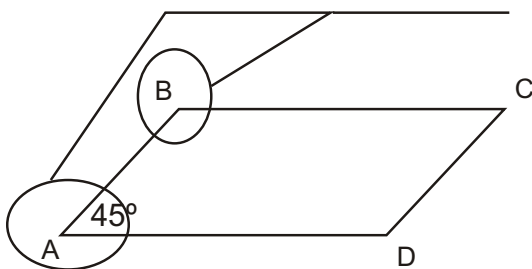


The only angle that is given above is angle BAD. We know that angle BCD is  $45^\circ$  because the angle diagonally opposite from BCD is  $45^\circ$ .

What about angle ABC or angle ADC? How can we find one of those angles if neither one of them is given?

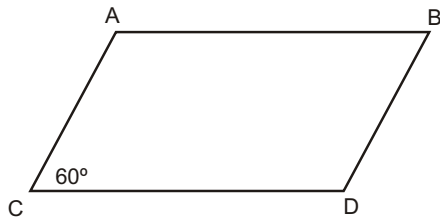


To find those angles ABC and ADC a rule that angles that are next to each other add up to  $180^\circ$  is the clue needed to find the other two angles.



For example, these two angles which are right next to each other must add up to equal  $180^\circ$ .

$$\begin{aligned} \angle BAD + \angle ABC &= 180^\circ \\ 45^\circ + \text{angle ABC} &= 180^\circ \\ -45 & \quad \underline{-45} \\ & 135^\circ \end{aligned}$$



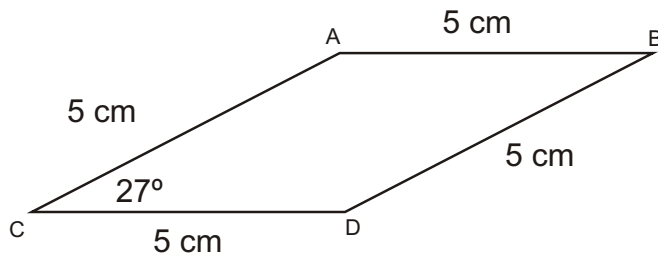
1)  $\angle ACD = \angle$  \_\_\_\_\_

2)  $\overline{AB} = \overline{CD}$  and  $\overline{AC} =$  \_\_\_\_\_

3)  $\angle ABD =$  \_\_\_\_\_ degrees

4)  $\angle CAB =$  \_\_\_\_\_ degrees

5) when all four angles of the parallelogram are added up, how many degrees total are there? \_\_\_\_\_



6) If angle  $ACD = 27^\circ$ , then angle  $ABD =$  \_\_\_\_\_  $^\circ$  and angle  $CAB =$  \_\_\_\_\_  $^\circ$

7)  $\overline{AC} \parallel \overline{BD}$  and  $\overline{AB} \parallel$  \_\_\_\_\_

8) Which two angles of the parallelogram are obtuse? \_\_\_\_\_

9) Which two angles of the parallelogram are acute? \_\_\_\_\_

10) If  $\overline{AC}$ ,  $\overline{AB}$ ,  $\overline{BD}$  and  $\overline{CD}$  are each 5 cm, what is the perimeter of the parallelogram? \_\_\_\_\_

(Hint: the perimeter is the distance all the way around an object.)