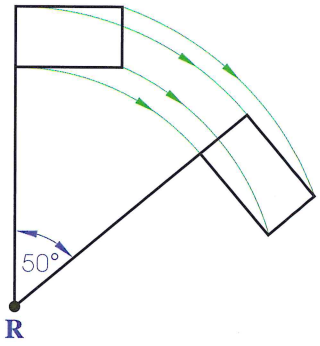
Rotations

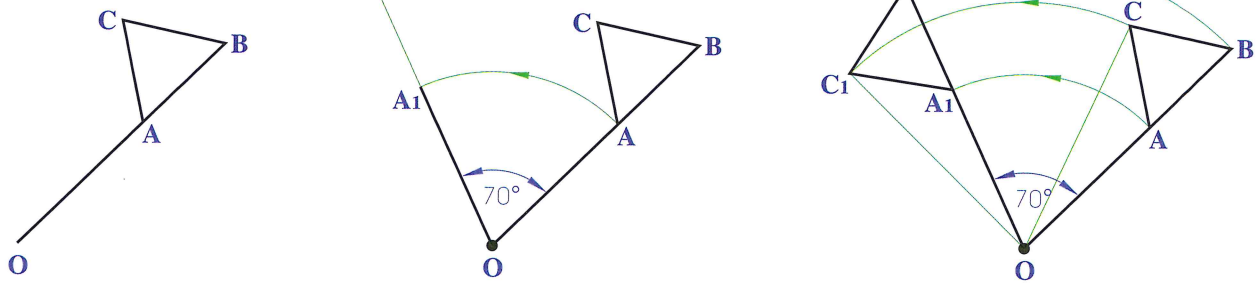
Under a **rotation** a figure is turned about a fixed point through a certain angle. The fixed point is called the **centre of rotation** and the angle is called the **angle of rotation**.



The figure across shows a flag that has been rotated clockwise through an angle of 50° about the point R. The point R is fixed and everything else is moved around it. The rotated figure is the same shape and size as the original figure.

Example 1

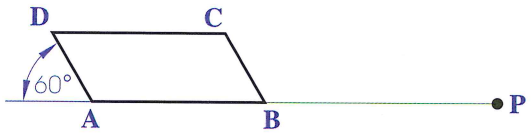
Rotate the **flag** ABC anti-clockwise through 70°, about centre O.

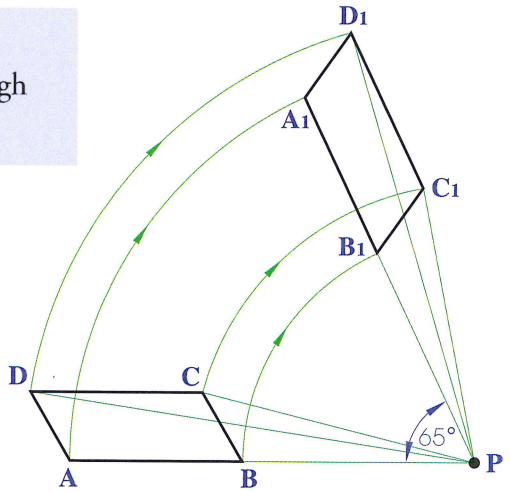


1. With centre O and radius OA, swing an arc in an anti-clockwise direction from A.
2. Draw a line from O at 70° to OA to locate A_1. A_1 is the image of A under the given rotation.
3. Repeat the procedure for the points B and C. Join the points in order to complete the image.

Example 2

Rotate the given parallelogram ABCD **clockwise** through an angle of 65° about the point P.

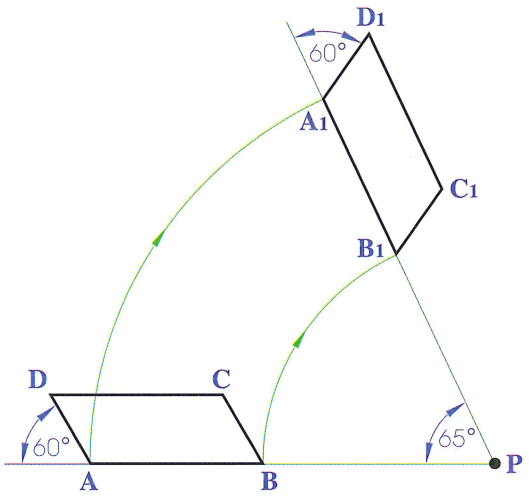




1. With centre P and radii PA and PB respectively, draw arcs in a clockwise direction.
2. Draw a line from P at an angle of 65° to PA to locate points A_1 and B_1 respectively.
3. Join PC. With centre P and radius PC, draw an arc in a clockwise direction. Draw a line from P at an angle of 65° to PC to locate C_1.
4. Repeat the procedure for the remaining point D. Join the image points in order.

Alternative Solution

1. The image of the figure can also be determined by rotating the base AB in a clockwise direction, about P, through an angle of 65°.
2. Extend B_1A_1 beyond A_1. Draw A_1D_1 at an angle of 60° at A_1B_1 and of a length equal to that of AD.
3. Draw a line from B_1 parallel to A_1D_1, and a line from D_1 parallel to A_1B_1, to locate the point C_1. Complete the image by joining the points in order.

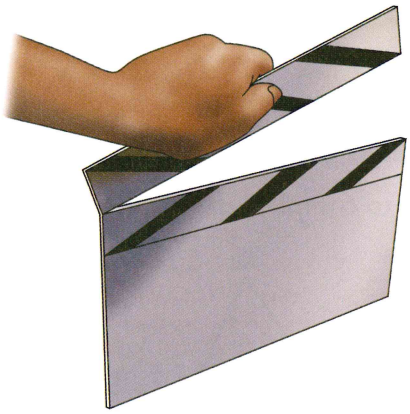


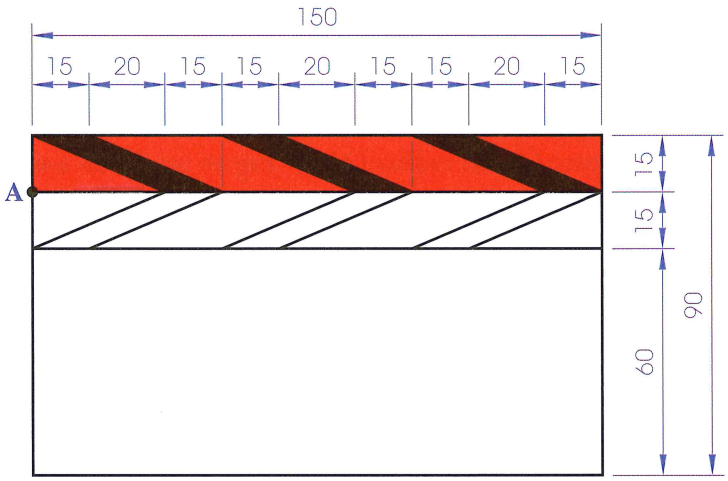
Exercises

Answer Worksheet 15B

1. **(a)** Copy the view of the **film clipboard** shown in the figure below.

   (b) Draw the image of the shaded portion of the clipboard when it is rotated about the point A through an angle of 40° in an *anti-clockwise* direction.





2. **(a)** Copy the drawing of the **stapler** shown in the figure below.

   (b) Draw the image of the shaded portion of the stapler when it is rotated about the point A through an angle of 120° in a *clockwise* direction.