

The procedure is as follows:
 Place the propeller on a sheet of paper laid on a flat surface and mark the centre of the boss. Then scribe a line on the surface of a blade at about two-thirds of the distance to the tip, where the blade is usually widest. Measure heights x and y above the table, i.e. at the edges of the blade. Transfer points x and y to the paper, remove the propeller and measure angle ϕ in degrees.

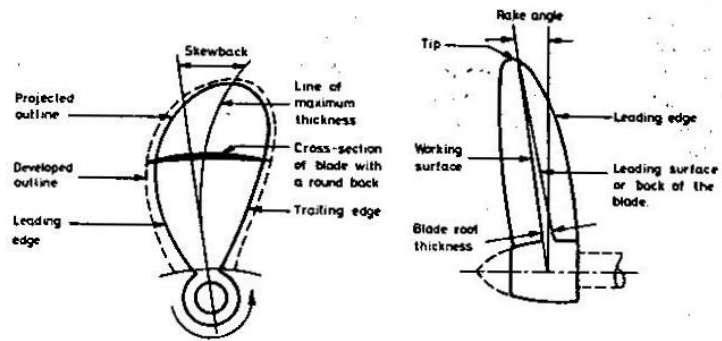
$$\text{Pitch} = (x - y) \times \frac{360}{\phi}$$

Note that propellers usually have a constant pitch from near the hub to the tip. Points x and y can be measured at different radial positions, but it is best to use the maximum blade width for greatest accuracy in the calculation.

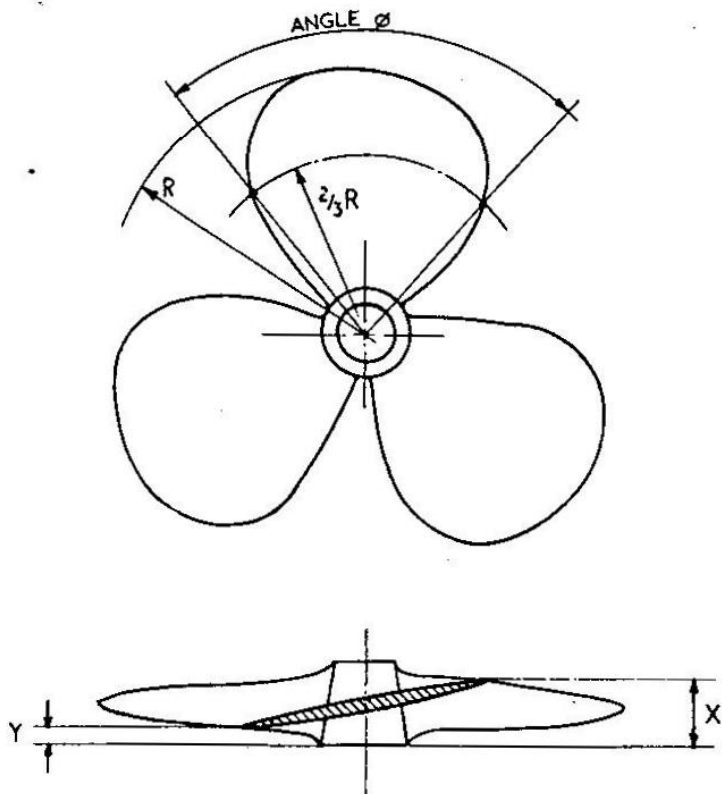
On the subject of accuracy, you can check whether there is any variation of pitch from the quoted figure and from one blade to the others by repeating the measuring procedure on the other blades and comparing the results. A variation of only 1 mm (0.040 in) with an angle ϕ of 60° represents a pitch variation of 6 mm (approx $\frac{1}{4}$ in) at the points checked. The inspection of propellers by the manufacturer would be carried out at several radial points on each blade - excessive variations resulting in the propeller being rejected or at least having its blades modified so that acceptable standards of accuracy are achieved.

Pitch blocks are used to check pitch and are useful when assessing damage or the accuracy of a repair. Blade-to-blade pitch variation can cause vibration, as well as affecting propeller efficiency. A *pitchometer* is used to give a direct measurement of pitch by means of a special dial gauge.

Propellers are also checked for balance, because an out-of-balance propeller can cause vibration of the shaft.



*Propeller features (Perkins)
 The rear face of a left-hand propeller blade is shown
 - also the side view*



Measuring pitch