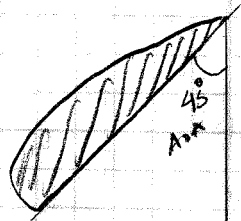


22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD



Prop turning but no forward motion



45° AOA

$\langle 0, -97 \rangle$

Add forward motion

$$AOA_{New} = 45^\circ - \tan^{-1}\left(\frac{3}{9}\right) = 26.56^\circ$$

Notice the reduced angle of attack caused by the forward motion of the propeller. This reduction is one of the reasons for adjustable pitch props

\vec{v}_R

\vec{v}_f

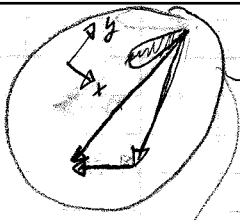
$\langle -3, 0 \rangle$

$\langle 0, -97 \rangle$

Rotate the axis to simplify calculations

Forward Motion in tilted Axis

$$New AOA = 45^\circ - \tan^{-1}\left(\frac{\sqrt{3}}{9+\sqrt{3}}\right) = 35.23^\circ$$

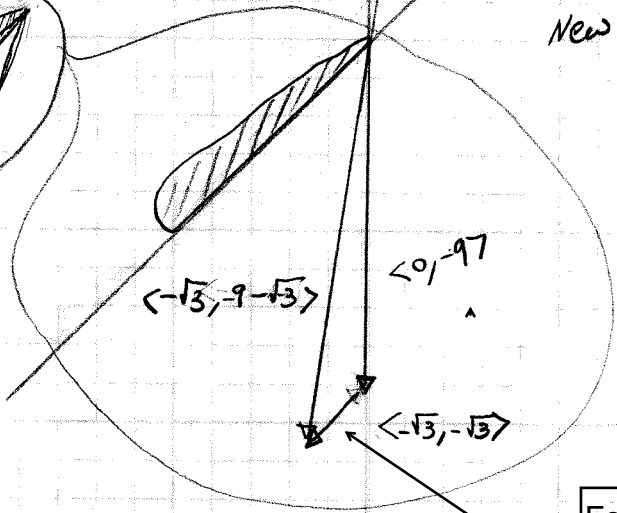


$\langle -\sqrt{3}, 9-\sqrt{3} \rangle$

$\langle 0, -97 \rangle$

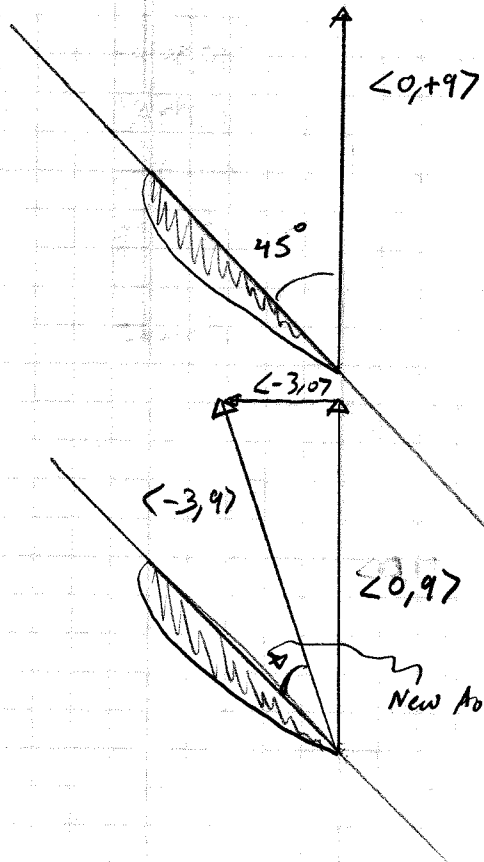
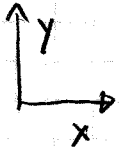
$\langle -\sqrt{3}, -\sqrt{3} \rangle$

Forward motion of the propeller



P-FACTOR

ASCENDING BLADE

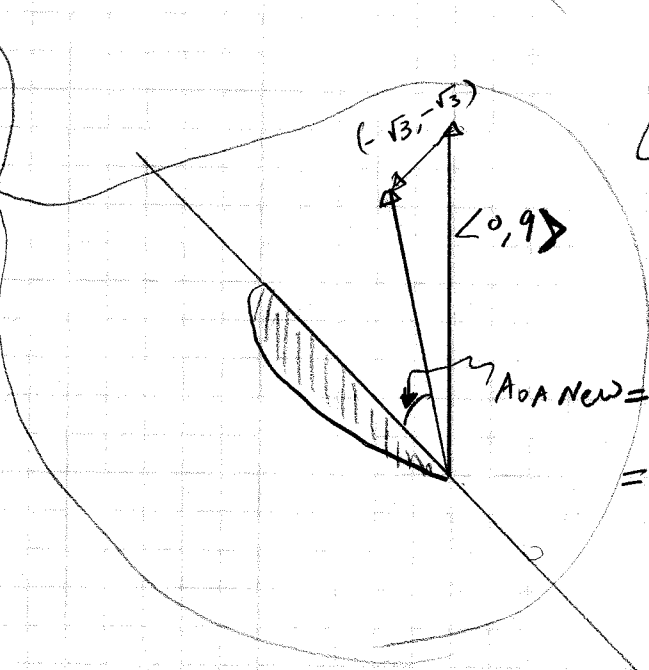
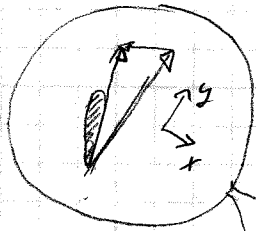


Prop turning but no forward motion

Add forward motion

$$\text{New } AOA = 45^\circ - \tan^{-1}\left(\frac{3}{9}\right) = 26.56^\circ$$

Rotate the axis to simplify calculations



Add forward motion in tilted Axis

$$AOA_{\text{New}} = 45^\circ - \tan^{-1}\left(\frac{+\sqrt{3}}{9-\sqrt{3}}\right) = \underline{\underline{31.59^\circ}}$$