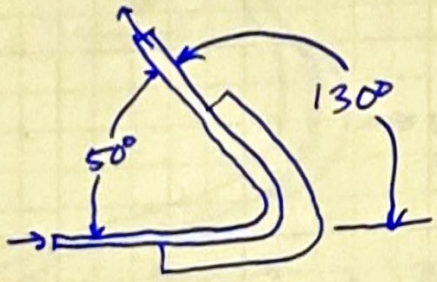
Adam Chase | HW 2.3 | MET330

16.6



$T = 180°F$
$\theta = 130°$
$V = 22.0$ ft/s
$A = 2.95$ in^2
$= \frac{2.95}{12^2} = 0.02$ ft^2

$Q = AV = (0.02)(22) = 0.44$ ft^3/s

$V_{2x} = V\cos(180-130) = 22\cos(50)$
$= 14.14$ ft/s

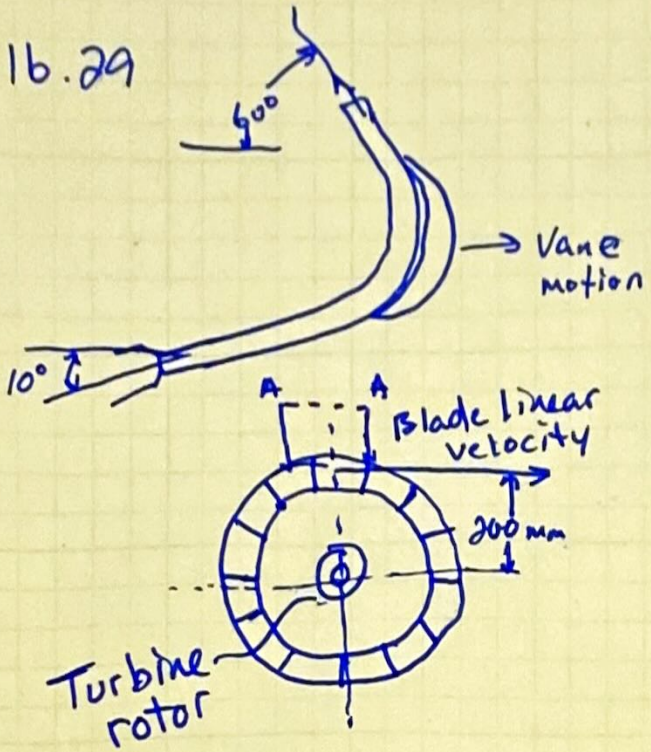
$V_{2y} = V\sin(180-130) = (22)\sin(50)$
$= 16.85$ ft/s

$F_x = \rho Q[V_{2x} - V_{1x}]$ $\rho = 1.88$ slugs (From Chart)

$F_x = (1.88)(0.44)(14.14+22)$
$F_x = 29.94$ lb

$F_y = (1.88)(0.44)(16.85-0)$
$F_y = 13.96$ lb

16.29



Water

$T = 15°C$

$d = 7.50\ mm = 0.0075\ m$

$v = 25\ m/s$

$A = \frac{\pi\, 0.0075^2}{4}$

$A = 4.418 \times 10^{-5}\ m^2$

$Q = VA$

$= (4.418 \times 10^{-5})(25)$

$= 1.1045 \times 10^{-3}\ m^3/s$

$R_x = \rho Q[v_2 \cos 60 + v_1 \cos 10)]$

A.1 chart

$\rho = 1000\ kg/m^3$

$R_x (1000)(1.1045 \times 10^{-3})[25\cos 60 + 25\cos 10]$

$R_x = 40.99\ N$

$R_y = (1000)(1.1045 \times 10^{-3})[25 \sin 60° - 25 \sin 10°]$

$R_y = 19.12\ N$