P #6

Ch 9 Worksheet

$A = 20.0\ m^2$

$v_1 = 300\ m/s$
$v_2 = 280\ m/s$

$\rho_{air} = 1.20\ kg/m^3$

$y_1 \approx y_2$ (height between top & bottom of wing is negligible)

$$P_1 + \cancel{\rho \cdot g \cdot y_1} + \tfrac{1}{2} \cdot \rho \cdot v_1^2 = P_2 + \cancel{\rho \cdot g \cdot y_2} + \tfrac{1}{2} \cdot \rho \cdot v_2^2$$

$$P_1 + \tfrac{1}{2} \cdot (1.20\ kg/m^3)(300\ m/s)^2 = P_2 + \tfrac{1}{2}(1.20\ kg/m^3)(280\ m/s)^2$$

$$P_1 + 54000 = P_2 + 47{,}040$$

$$P_2 - P_1 = 54000 - 47{,}040$$

$$\Delta P = 6960\ Pa$$

$$P = \frac{F}{A}$$

$$6960\ Pa = \frac{F}{20\ m^2}$$

$$F = 1.39 \times 10^5\ N$$