(3)

$$F_p = \frac{d}{2}\int_0^{2\pi}(p_1 - p_\infty)cos\theta d\theta$$

$$= \frac{d}{2} \times 2\int_0^{\pi}(p_1 - p_\infty)cos\theta d\theta$$

$$= d\int_0^{\pi}\rho_{al}glkcos\theta d\theta$$

$$= d\rho_{al}gk\int_0^{\pi}lcos\theta d\theta$$

$$= d\rho_{al}gk\left(l_{0°}cos0° + 2 \times l_{5°}cos5° + \cdots + 2 \times l_{175°}cos175° + l_{180°}cos180°\right) \times 5 \times \frac{\pi}{180} \times \frac{1}{2}$$