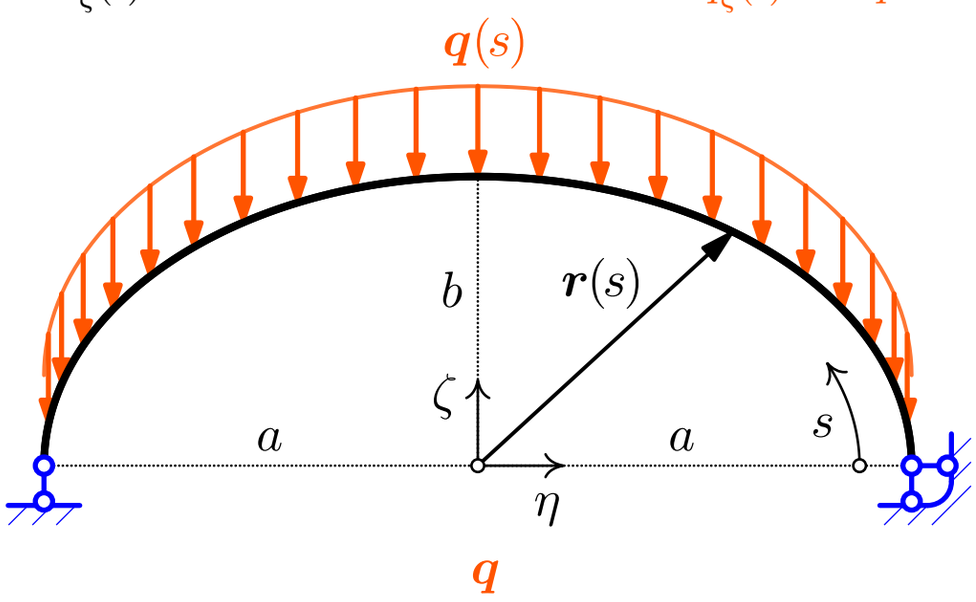
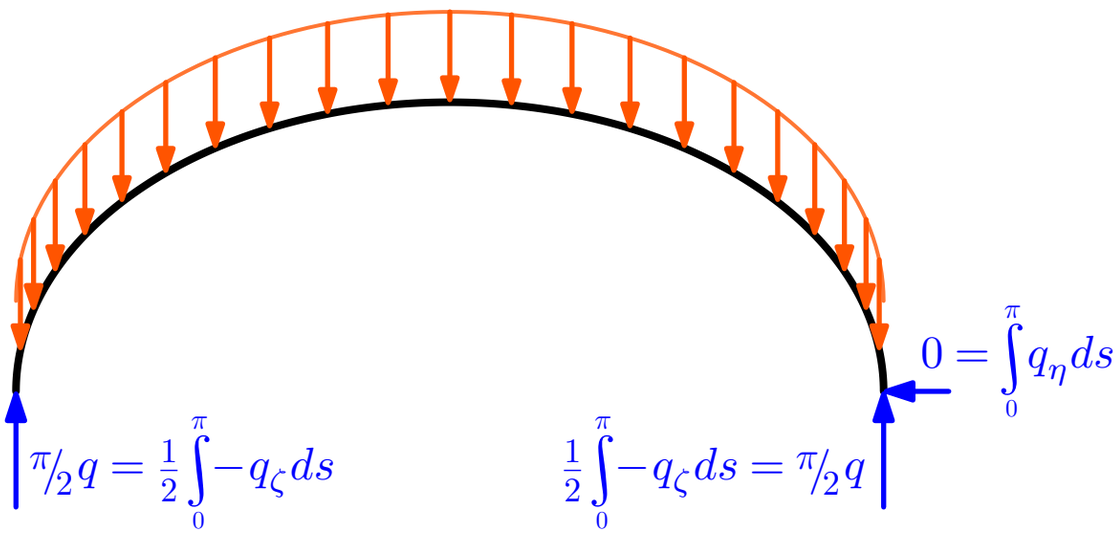
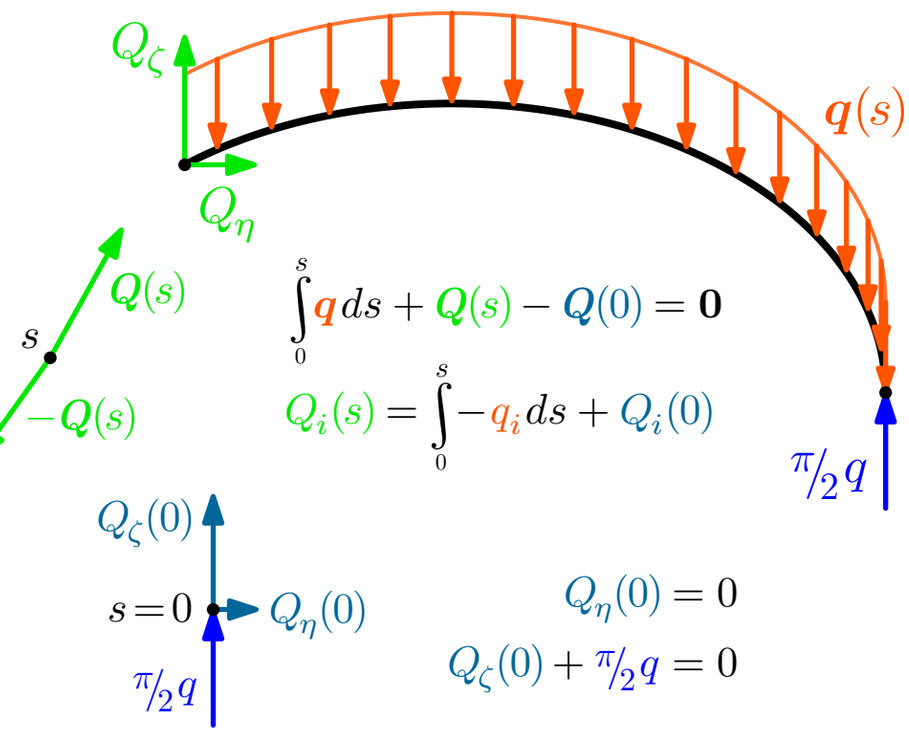
Le problème de Vadique à propos d'une poutre elliptique

$$r_\eta(s) = a\cos s$$
$$r_\zeta(s) = b\sin s$$

$$q_\eta(s) = 0$$
$$q_\zeta(s) = -q$$



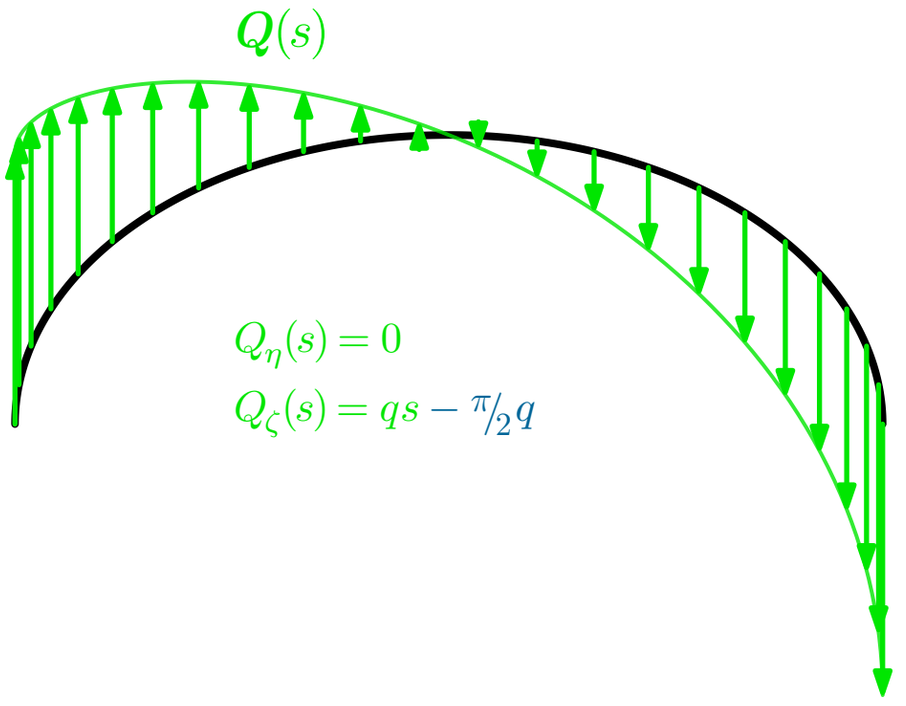




$$\int_0^s \boldsymbol{q}\,ds + \boldsymbol{Q}(s) - \boldsymbol{Q}(0) = \mathbf{0}$$

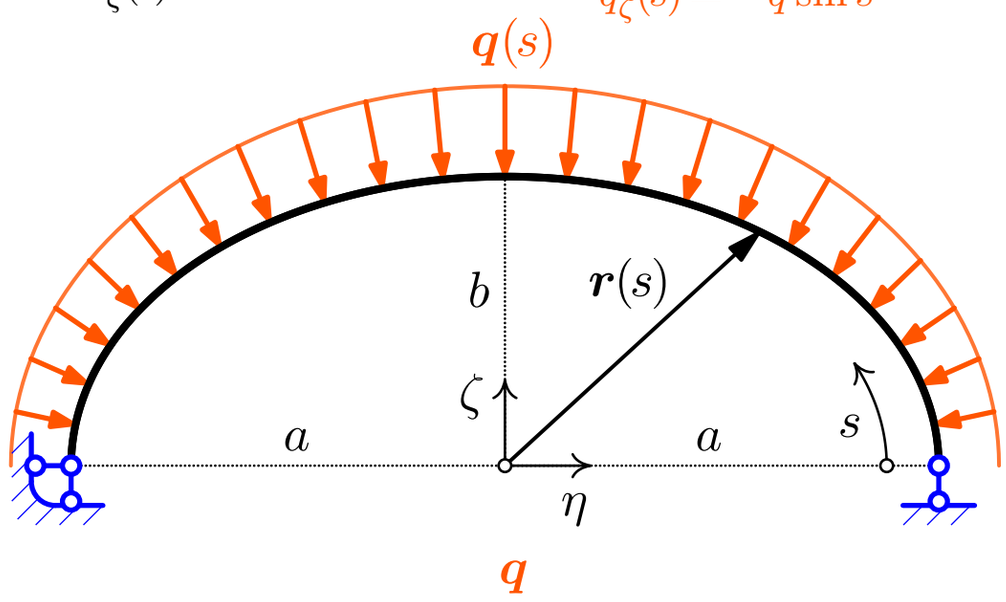
$$Q_i(s) = \int_0^s -q_i\,ds + Q_i(0)$$

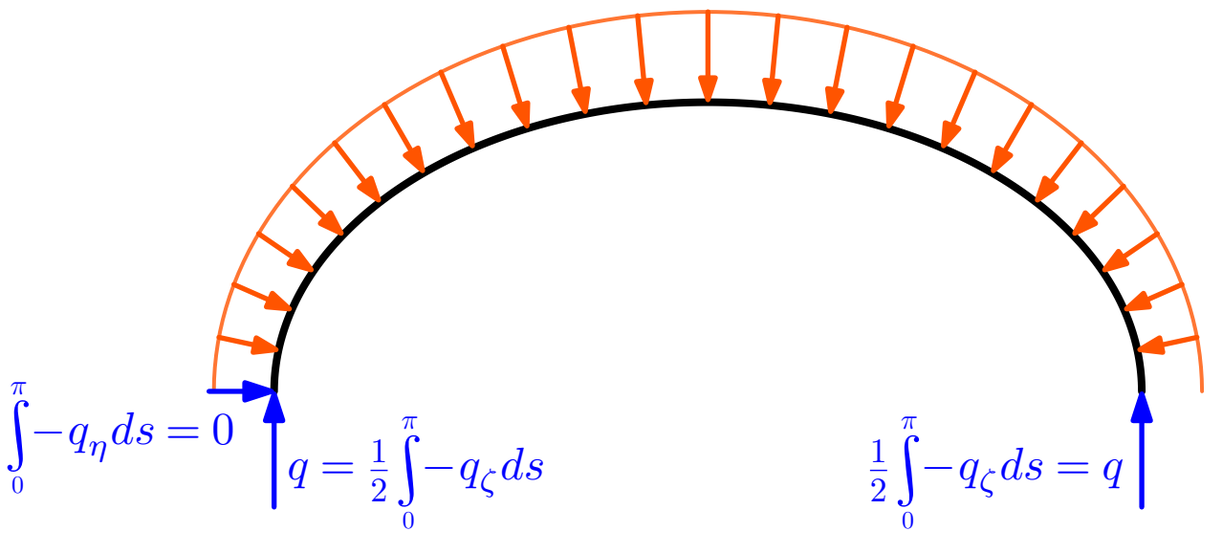
$$Q_\eta(0) = 0$$
$$Q_\zeta(0) + \pi/2\, q = 0$$

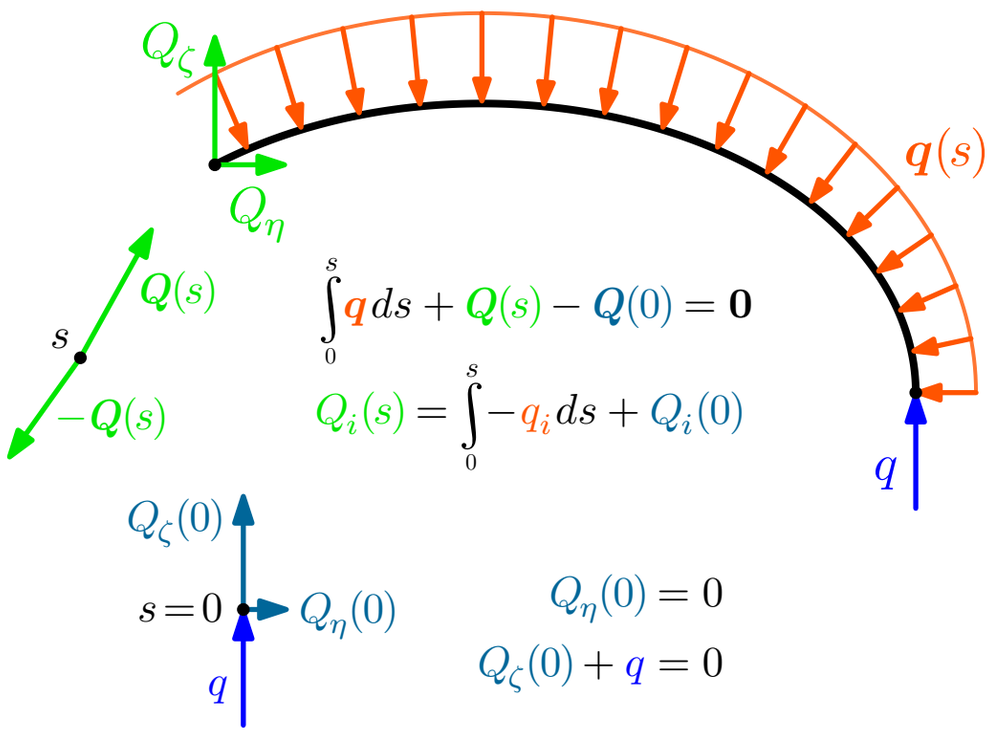


$$r_\eta(s) = a\cos s$$
$$r_\zeta(s) = b\sin s$$

$$q_\eta(s) = -\frac{b}{a}\,q\cos s$$
$$q_\zeta(s) = -q\sin s$$



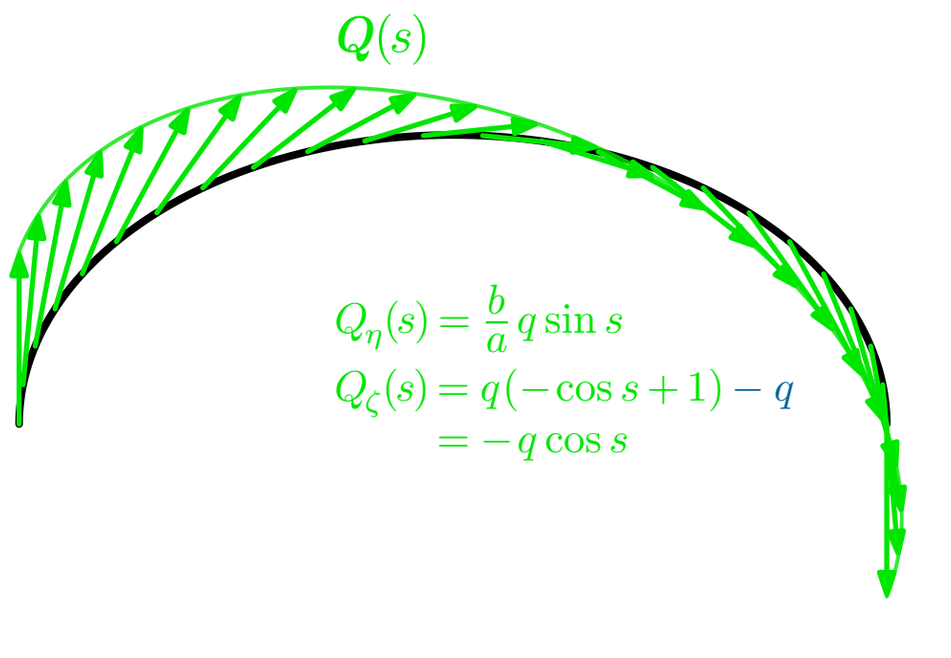


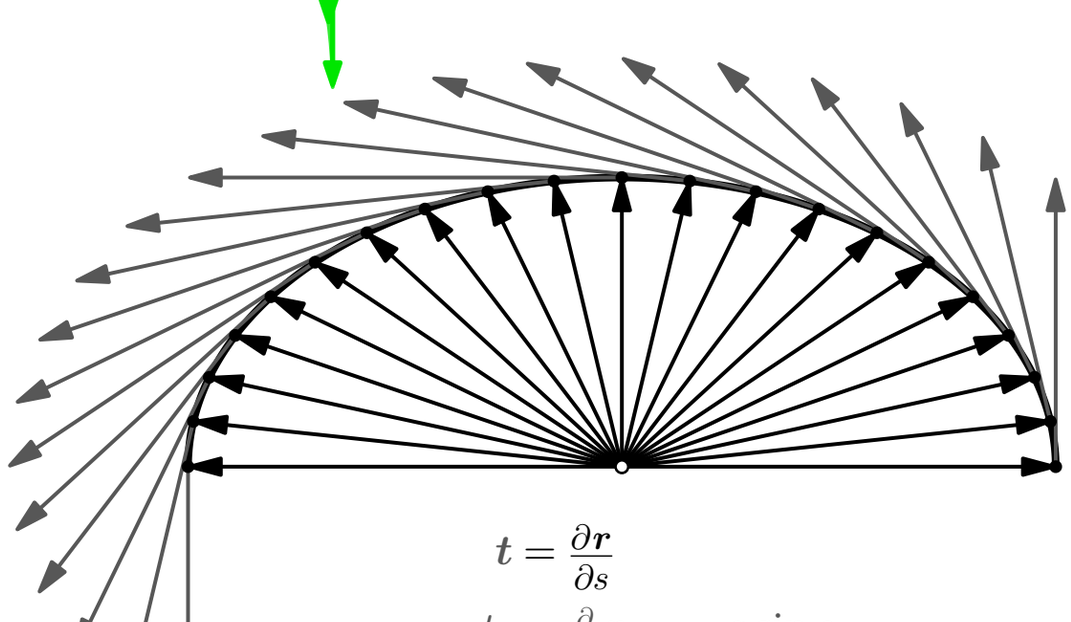


$$\int_0^s \boldsymbol{q}\,ds + \boldsymbol{Q}(s) - \boldsymbol{Q}(0) = \mathbf{0}$$

$$Q_i(s) = \int_0^s -q_i\,ds + Q_i(0)$$

$$Q_\eta(0) = 0$$
$$Q_\zeta(0) + q = 0$$





$$\boldsymbol{t} = \frac{\partial \boldsymbol{r}}{\partial \boldsymbol{s}}$$
$$t_\eta = \frac{\partial}{\partial s} r_\eta = -a\sin s$$
$$t_\zeta = \frac{\partial}{\partial s} r_\zeta = b\cos s$$

$$Q_t = Q \bullet \frac{t}{\|t\|}\frac{t}{\|t\|} = \frac{Q \bullet tt}{t \bullet t}$$

$$Q_t = Q \bullet \frac{t}{\|t\|}\frac{t}{\|t\|} = \frac{Q \bullet tt}{t \bullet t}$$

$$\int_0^s (\boldsymbol{r} \times \boldsymbol{q})\,ds + \boldsymbol{r}(s) \times \boldsymbol{Q}(s) - \boldsymbol{r}(0) \times \boldsymbol{Q}(0) + \boldsymbol{M}(s) - \boldsymbol{M}(0) = \mathbf{0}$$