For → zone-0: Here,

$$F(x) = Ax + By + C$$

$$\therefore F(P) = Ax_p + By_p + C = F(x_p, y_p)$$

$$\therefore F(M) = F\left(x_p+1, y_p+\frac{1}{2}\right)$$

$$= A(x_p+1) + B\left(y_p+\frac{1}{2}\right) + C$$

$$\therefore F(M_E) = F\left(x_p+2, y_p+\frac{1}{2}\right)$$

$$= A(x_p+2) + B\left(y_p+\frac{1}{2}\right) + C$$

$$\therefore F(M_{NE}) = F\left(x_p+2, y_p+\frac{3}{2}\right)$$

$$= A(x_p+2) + B\left(y_p+\frac{3}{2}\right) + C$$

We know,

$$d_{init} = F(M) - F(P)$$

$$= A(x_p+1) + B\left(y_p+\frac{1}{2}\right) + C - Ax_p - By_p - C$$

$$= Ax_p + A + By_p + \frac{B}{2} + C - Ax_p - By_p - C$$

$$= A + \frac{B}{2}$$

$$= dy - \frac{dx}{2} \quad [\because A = dy \text{ and } B = -dx]$$

again, $d_E = F(M_E) - F(M)$

$$= A(x_p+2) + B\left(y_p+\frac{1}{2}\right) + C - A(x_p+1) - B\left(y_p+\frac{1}{2}\right) - C$$

$$= Ax_p + 2A - Ax_p - A$$

$$= A$$

$$= dy \quad [\because A = dy]$$

and, $d_{NE} = F(M_{NE}) - F(M)$

$$= A(x_p+2) + B\left(y_p+\frac{3}{2}\right) + C - A(x_p+1) - B\left(y_p+\frac{1}{2}\right) - C$$

$$= Ax_p + 2A + By_p + \frac{3B}{2} - Ax_p - A - By_p - \frac{B}{2}$$

$$= A + B = dy - dx \quad [\because A = dy \text{ and } B = -dx]$$