Region-2
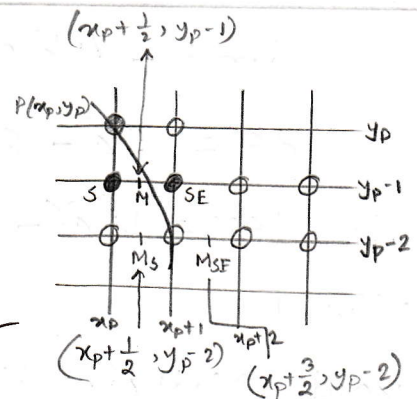
$$F(M) = (x_p + \tfrac{1}{2}, \; y_p - \tfrac{1}{2})$$

$$= b^v (x_p + \tfrac{1}{2})^v + a^v (y_p - 1)^v - a^v b^v$$

$$F(M_s) = (x_p + \tfrac{1}{2}, \; y_p - 2)$$

$$= b^v (x_p + \tfrac{1}{2})^v + a^v (y_p - 2)^v - a^v b^v$$

$$F(M_{SE}) = (x_p + \tfrac{3}{2}, \; y_p - 2)$$

$$= b^v (x_p + \tfrac{3}{2})^v + a^v (y_p - 2)^v - a^v b^v$$

$\therefore$ dinit $= F(M) - F(P)$

$$= b^v (x_p + \tfrac{1}{2})^v + a^v (y_p - 1)^v - a^v b^v - b^v x_p^v - a^v y_p^v + a^v b^v$$

$$= b^v x_p^v + b^v x_p + \frac{b^v}{4} + a^v y_p^v - 2a^v y_p + a^v - b^v x_p^v - a^v y_p^v$$

$$= b^v x_p - 2a^v y_p + a^v + \frac{b^v}{4}$$

$\therefore$ ds $= F(M_s) - F(M)$

$$= b^v (x_p + \tfrac{1}{2})^v + a^v (y_p - 2)^v - a^v b^v - b^v (x_p + \tfrac{1}{2})^v - a^v (y_p - 1)^v + a^v b^v$$

$$= a^v y_p^v - 4a^v y_p + 4a^v - a^v y_p^v + 2a^v y_p - a^v$$

$$= 3a^v - 2a^v y_p$$

$\therefore$ dSE $= F(M_{SE}) - F(M)$

$$= b^v (x_p + \tfrac{3}{2})^v + a^v (y_p - 2)^v - a^v b^v - b^v (x_p + \tfrac{1}{2})^v - a^v (y_p - 1)^v + a^v b^v$$

$$= b^v x_p^v + 3b^v x_p + \frac{9b^v}{4} + a^v y_p^v - 4a^v y_p + 4a^v - b^v x_p^v - b^v x_p$$

$$- \frac{b^v}{4} - a^v y_p^v + 2a^v y_p - a^v$$

$$= 3a^v - 2a^v y_p + 2b^v x_p + 2b^v$$