$$D = D_1 + D_2 .$$

$$D_1 = \sqrt{S_A^2 + y^2} .$$

$$D_2 = \sqrt{S_B^2 + (x-y)^2} .$$

$$D = \sqrt{S_A^2 + y^2} + \sqrt{S_B^2 + (x-y)^2} .$$

$$\frac{dD}{dy} = \frac{2y}{2\sqrt{S_A^2 + y^2}} - \frac{2(x-y)}{2\sqrt{(x-y)^2 + S_B^2}} = 0 .$$

$$\Rightarrow \frac{y}{\sqrt{S_A^2 + y^2}} = \frac{x-y}{\sqrt{(x-y)^2 + S_B^2}} .$$

$$y\sqrt{(x-y)^2+S_B^2} = (x-y)\sqrt{S_A^2+y^2}$$

$$y^2((x-y)^2+S_B^2) = (x-y)^2(S_A^2+y^2)$$

$$y^2(x^2-2xy+y^2+S_B^2) = (x^2-2xy+y^2)(S_A^2+y^2).$$

$$y^2x^2 - 2xy^3+y^4+S_B^2y^2 = x^2S_A^2+x^2y^2 - 2xyS_A^2 - 2xy^3 + S_A^2y^2+y^4.$$

$$S_B^2y^2 = x^2S_A^2 - 2xyS_A^2 + S_A^2y^2.$$

$$S_B^2y^2 = x^2S_A^2 - 2xS_A^2y + S_A^2y^2.$$

$$(S_B^2-S_A^2)y^2 + 2xS_A^2y - x^2S_A^2 = 0.$$

$$y = \frac{-2xS_A^2 \pm \sqrt{4x^2S_A^4 + 4(S_B^2-S_A^2)x^2S_A^2}}{2(S_B^2-S_A^2)}.$$