```
Upon solving the integral \int_0^{\Delta s_j} (as_j + b) \frac{As_j + B}{s_j^2 + Cs_j + D} ds_j, the following solution is
```

$$-(\gamma j+1-\gamma j)\cos{(\theta i-\theta j)}-(\frac{((-x i+\hat{x} i)\cos{(\theta j)}+(-y j+\hat{y} i)\sin{(\theta j)})(\gamma j+1-\gamma j)}{2\Delta s j}+\\\frac{(\gamma j+1-\gamma j)(2\sin{(\theta j)}y j-2\sin{(\theta j)}\hat{y} i+2\cos{(\theta j)}x i-2\cos{(\theta j)}\hat{x} i)\cos{(\theta i-\theta j)}}{2\Delta s j}-\\\frac{2\Delta s j}{2\Delta s j}-\\\frac{2\Delta s j}{2\Delta s j}-\frac{((-x i+\hat{x} i)\cos{(\theta j)}+(-y j+\hat{y} i)\sin{(\theta j)})(\gamma j+1-\gamma j)(2\sin{(\theta j)}y j-2\sin{(\theta j)}\hat{y} i+2\cos{(\theta j)}\hat{x} i-2\cos{(\theta j)}\hat{x} i)}{\Delta s j}+2((-x i+\hat{y} i)\sin{(\theta j)})(-x i+\hat{y} i)\sin{(\theta j)})(-x i+\hat{y} i)\sin{(\theta j)}(-x i)\cos{(\theta j-\theta j)}(-x i$$

$$\log \left(\frac{-\frac{2((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)})((-xi+\hat{x}i)^2+(-yj+\hat{y}i)^2)(\gamma j+1-\gamma j)}{\Delta sj} + ((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)})(2\sin{(\theta j)}yj-2\sin{(\theta j)}yj - 2\sin{(\theta j)}yj$$

$$\frac{\left(\frac{((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)})(\gamma j+1-\gamma j)}{2\Delta s j} + \frac{(\gamma j+1-\gamma j)(2\sin{(\theta j)}y j-2\sin{(\theta j)}\hat{y}i+2\cos{(\theta j)}\hat{x}i-2\cos{(\theta j)}\hat{x}i)\cos{(\theta i-\theta j)}}{2\Delta s j} - \frac{\cos{(\theta i-\theta j)}\gamma j}{2} - \frac{\cos{(\theta i-\theta j)}\gamma j}{2} - \frac{((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)})(\gamma j+1-\gamma j)(2\sin{(\theta j)}y j-2\sin{(\theta j)}\hat{y}j+2\cos{(\theta j)}\hat{x}i-2\cos{(\theta j)}\hat{x}i)}{\Delta s j} + 2((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)}\hat{y}i+2\cos{(\theta j)}\hat{x}i-2\cos{(\theta j)}\hat{x}i-2\cos{(\theta j)}\hat{x}i-2\cos{(\theta j)}\hat{x}i)}{2\sqrt{-4}} + 2((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)}\hat{x}i-2\cos{(\theta j)}$$

$$\log\left(\Delta sj+\frac{-\frac{2((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)})((-xi+\hat{x}i)^2+(-yj+\hat{y}i)^2)(\gamma j+1-\gamma j)}{\Delta sj}+((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)})(2\sin{(\theta j)}yj-2\sin{(\theta j)}yj-2\sin{(\theta j)}yj-2\sin{(\theta j)}yj-2\cos{(\theta j)}xi-2\cos{(\theta j)}xi)\cos{(\theta i-\theta j)}}{2\Delta sj}-\frac{((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)})(\gamma j+1-\gamma j)}{2\Delta sj}+\frac{(\gamma j+1-\gamma j)(2\sin{(\theta j)}yj-2\sin{(\theta j)}yj-2\sin{(\theta j)}yj-2\sin{(\theta j)}yi+2\cos{(\theta j)}xi-2\cos{(\theta j)}\hat{x}i)\cos{(\theta i-\theta j)}}{2\Delta sj}+2((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)})(\gamma j+1-\gamma j)(2\sin{(\theta j)}yj-2\sin{(\theta j)}yj-2\sin{(\theta j)}\hat{y}i+2\cos{(\theta j)}xi-2\cos{(\theta j)}\hat{x}i)}}{2\sqrt{-\theta i}}$$

$$\frac{\cos\left(\theta i - \theta j\right)\gamma j}{2} + \frac{-\frac{\left(\left(-x i + \hat{x} i\right)\cos\left(\theta j\right) + \left(-y j + \hat{y} i\right)\sin\left(\theta j\right)\right)\left(\gamma j + 1 - \gamma j\right)\left(2\sin\left(\theta j\right)y j - 2\sin\left(\theta j\right)y i + 2\cos\left(\theta j\right)x i - 2\cos\left(\theta j\right)\hat{x} i\right)}{2\sqrt{-2}}}{2\sqrt{-2}}$$

$$\log\left(\frac{-\frac{2((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)})((-xi+\hat{x}i)^2+(-yj+\hat{y}i)^2)(\gamma j+1-\gamma j)}{\Delta s j}+((-xi+\hat{x}i)\cos{(\theta j)}+(-yj+\hat{y}i)\sin{(\theta j)})(2\sin{(\theta j)}y j-2\sin{(\theta j)}y j-2\sin{(\theta$$

$$\frac{\cos{(\theta i - \theta j)\gamma j}}{2} + \frac{-\frac{((-xi + \hat{x}i)\cos{(\theta j)} + (-yj + \hat{y}i)\sin{(\theta j)})(\gamma j + 1 - \gamma j)(2\sin{(\theta j)}yj - 2\sin{(\theta j)}\hat{y}i + 2\cos{(\theta j)}xi - 2\cos{(\theta j)}\hat{x}i)}{\Delta sj} + 2((-xi + \hat{x}i)\cos{(\theta j)} + (-yj + \hat{y}i)\sin{(\theta j)})(\gamma j + 1 - \gamma j)(2\sin{(\theta j)}yj - 2\sin{(\theta j)}\hat{y}i + 2\cos{(\theta j)}xi - 2\cos{(\theta j)}\hat{x}i)}{2\sqrt{-\theta j}} + 2((-xi + \hat{x}i)\cos{(\theta j)} + (-yj + \hat{y}i)\sin{(\theta j)})(\gamma j + 1 - \gamma j)(2\sin{(\theta j)}yj - 2\sin{(\theta j)}\hat{y}i + 2\cos{(\theta j)}xi - 2\cos{(\theta j)}\hat{x}i)}{2\sqrt{-\theta j}} + 2((-xi + \hat{x}i)\cos{(\theta j)} + (-yj + \hat{y}i)\sin{(\theta j)})(\gamma j + 1 - \gamma j)(2\sin{(\theta j)}yj - 2\sin{(\theta j)}\hat{y}i + 2\cos{(\theta j)}xi - 2\cos{(\theta j)}\hat{x}i)} + 2((-xi + \hat{x}i)\cos{(\theta j)} + (-yj + \hat{y}i)\sin{(\theta j)})(\gamma j + 1 - \gamma j)(2\sin{(\theta j)}yj - 2\sin{(\theta j)}\hat{y}i + 2\cos{(\theta j)}xi - 2\cos{(\theta j)}\hat{x}i)} + 2((-xi + \hat{x}i)\cos{(\theta j)} + (-yj + \hat{y}i)\sin{(\theta j)})(\gamma j + 1 - \gamma j)(2\sin{(\theta j)}yj - 2\sin{(\theta j)}\hat{y}i + 2\cos{(\theta j)}xi - 2\cos{(\theta j)}\hat{x}i)} + 2((-xi + \hat{x}i)\cos{(\theta j)} + (-yj + \hat{y}i)\sin{(\theta j)})(\gamma j + 1 - \gamma j)(2\sin{(\theta j)}yj - 2\sin{(\theta j)}\hat{y}i + 2\cos{(\theta j)}\hat{x}i) + 2((-xi + \hat{x}i)\cos{(\theta j)} + (-yj + \hat{y}i)\sin{(\theta j)}\hat{y}i + 2\cos{(\theta j)}\hat{x}i) + 2((-xi + \hat{x}i)\cos{(\theta j)}\hat{x}i) + 2((-xi + \hat$$