

$$\frac{|D_4|}{|A|} = \frac{-104}{-0.4+0.8\alpha} = \frac{104}{0.4-0.8\alpha} = 4$$

$$\frac{|D_2|}{|A|} = \frac{-110+164\alpha}{-0.4+0.8\alpha} = \frac{54\alpha+110}{0.4-0.8\alpha} = C$$

$$\frac{|D_3|}{|A|} = \frac{-88\alpha-8}{-0.4+0.8\alpha} = \frac{88\alpha+18}{0.4-0.8\alpha} = I$$

$$\frac{|D_5|}{|A|} = \frac{-14-24\alpha}{-0.4+0.8\alpha} = \frac{24\alpha+14}{0.4-0.8\alpha} = S$$

$$c) \quad \frac{\partial S}{\partial \alpha} = \frac{\partial(24\alpha+14)}{\partial \alpha} \cdot (0.4-0.8\alpha) - (24\alpha+14) \cdot \frac{\partial(0.4-0.8\alpha)}{\partial \alpha} \cdot \frac{1}{(0.4-0.8\alpha)^2}$$

$$= \frac{24(0.4-0.8\alpha) - (24\alpha+14)(-0.8)}{(0.4-0.8\alpha)^2}$$

$$\text{If } \alpha = 0.25 \Rightarrow 0.8 \cdot 0.25 = \frac{4}{5} \cdot \frac{1}{4} = \frac{1}{5} = 0.2$$

$$24 \cdot 0.25 = 24 \cdot \frac{1}{4} = 6$$

$$\Rightarrow \frac{24(0.4-0.2) - (6+14)(-0.8)}{(0.4-0.2)^2} = \frac{24(0.2) + (-20) \cdot (-0.8)}{(0.2)^2} \Rightarrow$$

$$\Rightarrow \frac{4.8 + 16}{0.04} = \frac{20.8}{0.04} = \boxed{520} = \frac{\partial S}{\partial \alpha} \text{ (at } \alpha = 0.25 \text{)}$$

$$S = \frac{20}{0.2} = 100 \Rightarrow \frac{\partial S}{\partial \alpha} \bigg|_{S(\alpha)} \bigg|_{\alpha=0.25} = \boxed{5.2}$$