

c)

$$W = \int_{\vec{r}_1}^{\vec{r}_2} \vec{F} \cdot d\vec{r} = \int_{\vec{r}_1}^{\vec{r}_2} Q_1 \vec{E} \cdot d\vec{r} \quad (25)$$

$$= \int_{\vec{r}_1}^{\vec{r}_2} Q_1 \vec{E} \cdot d\vec{r} \quad (26)$$

$$= 1 \cdot \left(- \int_{\vec{r}_1}^{\vec{r}_2} \vec{E} \cdot d\vec{r} \right) \quad (27)$$

$$= 1 \cdot \left(\Phi \left(\frac{c}{2} \right) - \Phi \left(\frac{c}{2} \right) \right) \quad (28)$$

$$= 1 \cdot \frac{k_0 a + b^2}{\epsilon} \left(\frac{2}{c} - \frac{1}{c} \right) \quad (29)$$

$$= 1 \cdot \frac{k_0 a + b^2}{\epsilon} \quad (30)$$