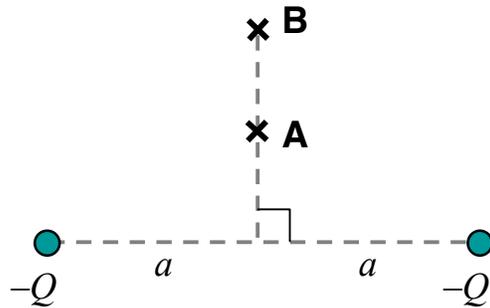


- 1) Two negative charges $-Q$ of the same magnitude are each located a distance a from the y -axis as shown in the diagram below. What is the sign of the potential difference between points A and B? [4]

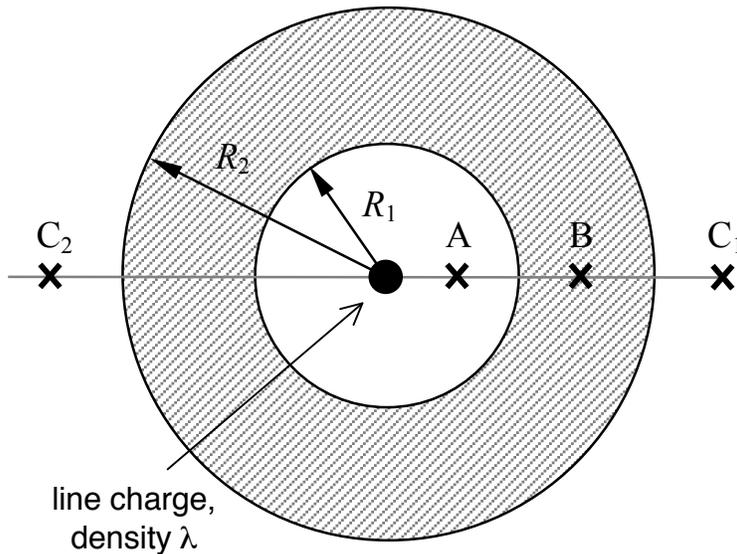


(a) $V_B - V_A <$

(c) $V_B - V_A > 0$

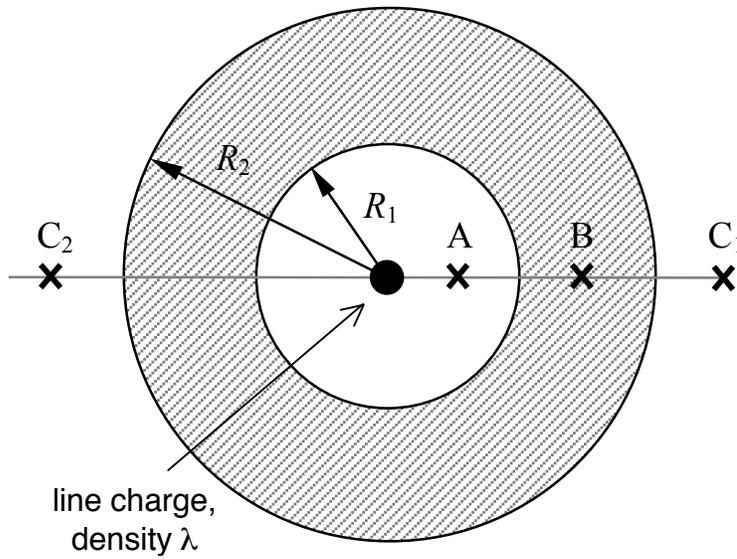
(b) $V_B - V_A = 0$

Consider an infinite line, of line charge density λ . Surrounding the line is a conducting, uncharged cylindrical shell of inner radius R_1 and outer radius R_2 . Take the electric potential to be **zero** at the **inner surface** of the cylindrical shell.



$R_1 = 8 \text{ cm}$
 $R_2 = 16 \text{ cm}$
 $\lambda = -3.5 \text{ C/m}$
 $A = 5 \text{ cm}$
 $B = 12 \text{ cm}$
 $C_1 = C_2 = 20 \text{ cm}$

- 2) What is the electric potential V_B at point B? [4]



$$\begin{aligned}
 R_1 &= 8 \text{ cm} \\
 R_2 &= 16 \text{ cm} \\
 \lambda &= -3.5 \text{ C/m} \\
 A &= 5 \text{ cm} \\
 B &= 12 \text{ cm} \\
 C_1 &= C_2 = 20 \text{ cm}
 \end{aligned}$$

3) What is the electric potential V_A at point A? [8]

4) What is the electric potential difference $V_{C_1} - V_{C_2}$ between points C_1 and C_2 ?
Provide a brief but clear argument supporting your answer. [4]