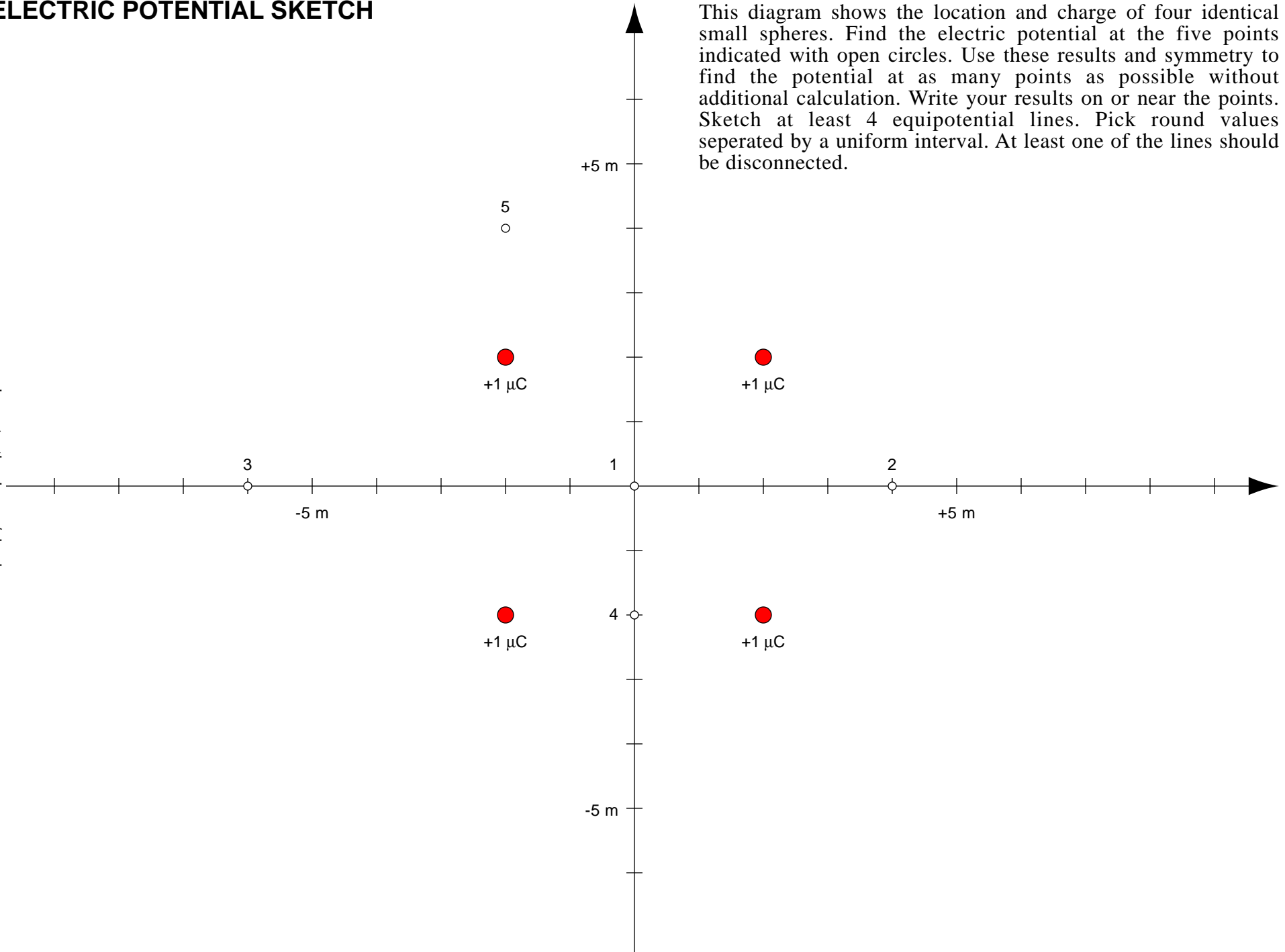


ELECTRIC POTENTIAL SKETCH

This diagram shows the location and charge of four identical small spheres. Find the electric potential at the five points indicated with open circles. Use these results and symmetry to find the potential at as many points as possible without additional calculation. Sketch at least 4 equipotential lines. Pick round values separated by a uniform interval. At least one of the lines should be disconnected.



1

$$V = \frac{kq}{r} = (9 \times 10^9 \text{ Nm}^2 / \text{C}^2)(1 \times 10^{-6} \text{ C}) \left(\frac{1}{\sqrt{8}} + \frac{1}{\sqrt{8}} + \frac{1}{\sqrt{8}} + \frac{1}{\sqrt{8}} \right) = 12,700 \text{ V}$$

2

$$V = \frac{kq}{r} = (9 \times 10^9 \text{ Nm}^2 / \text{C}^2)(1 \times 10^{-6} \text{ C}) \left(\frac{1}{\sqrt{8}} + \frac{1}{\sqrt{8}} + \frac{1}{\sqrt{40}} + \frac{1}{\sqrt{40}} \right) = 9,210 \text{ V}$$

3

$$V = \frac{kq}{r} = (9 \times 10^9 \text{ Nm}^2 / \text{C}^2)(1 \times 10^{-6} \text{ C}) \left(\frac{1}{\sqrt{20}} + \frac{1}{\sqrt{20}} + \frac{1}{\sqrt{68}} + \frac{1}{\sqrt{68}} \right) = 6,210 \text{ V}$$

4

$$V = \frac{kq}{r} = (9 \times 10^9 \text{ Nm}^2 / \text{C}^2)(1 \times 10^{-6} \text{ C}) \left(\frac{1}{2} + \frac{1}{2} + \frac{1}{\sqrt{20}} + \frac{1}{\sqrt{20}} \right) = 13,000 \text{ V}$$

5

$$V = \frac{kq}{r} = (9 \times 10^9 \text{ Nm}^2 / \text{C}^2)(1 \times 10^{-6} \text{ C}) \left(\frac{1}{2} + \frac{1}{\sqrt{20}} + \frac{1}{6} + \frac{1}{\sqrt{52}} \right) = 9,260 \text{ V}$$

