TEAM NAME (printed): * SOLUTIONS *

Team members **PRESENT** (printed names): _____

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(1) Determine the voltage between two points if 3 J of energy is required to move 7.2 mC between two points:

$V = W/Q = \frac{3\,J}{7.2\,mC} = \boxed{416.7\,V}$

(2) If the current in a wire is constant at 5 mA, how much time is required for 30 mC of charge to pass through the conductor?

$I = Q/t \quad \therefore t = \frac{Q}{I} = \frac{30\,mC}{5\,mA} = \boxed{6\,Sec}$

(3) If an ammeter in series with your car starter reads 125 A for a period of 4 seconds, determine the charge that passed through the meter.

$Q = I \cdot t$

$= (125A)(4\,Sec) = \boxed{500\,C}$

(4) Determine the distance between two charges, each of 25 μC, if the force between the two charges is 3.6×10^4 N.

$F = \frac{kQ_1Q_2}{r^2}, \quad k = 9 \times 10^9\ N \cdot m^2/C^2$

$\therefore r = \sqrt{\frac{kQ_1Q_2}{F}} = \sqrt{\frac{(9 \times 10^9\ N \cdot m^2/C^2)(25\,\mu C)(25\,\mu C)}{3.6 \times 10^4\ N}}$

$r = \sqrt{156.3\,\mu m^2} = \boxed{12.5\,mm}$