

5(a)	work done per unit charge
	work done (on charge) in moving positive charge from infinity (to the point)
5(b)(i)	electric field strength inversely proportional to distance ²
	$E = 3^2 \times 2.0 \times 10^5$ $= 1.8 \times 10^6 \text{ N C}^{-1}$
5(b)(ii)	$V = Q / 4\pi\epsilon_0 r$ and $E = Q / 4\pi\epsilon_0 r^2$ (so $E = V / r$)
	$r = (9.0 \times 10^4) / (1.8 \times 10^6) = 0.050 \text{ m} = 5.0 \text{ cm}$
5(b)(iii)	$Q = 4\pi\epsilon_0 Vr$
	$= 4\pi \times 8.85 \times 10^{-12} \times 9.0 \times 10^4 \times 0.050$ $= 5.0 \times 10^{-7} \text{ C}$
5(b)(iv)	$C = Q / V$
	$= (5.0 \times 10^{-7}) / (9.0 \times 10^4)$ $= 5.6 \times 10^{-12} \text{ F}$