1 /5

$y_0 = 5m$ ② $y = 0$ $V_{oy} = 0$ ②

$x_0 = 0$ $x = ?$ $V_{ox} = 2.5\ m/s$

② $y = y_0 + V_{oy}t + \frac{1}{2}at^2$

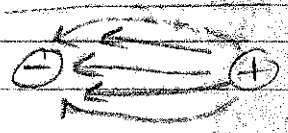
$0 = 5m - \frac{1}{2}(9.8\ m/s^2)t^2$ ② $t = 1.01\ sec$ ②

② $x = x_0 + V_{ox}t$

$x = 0 + (2.5\ m/s)(1.01s)$ ①

$x = 2.525\ m$ away ②

2 /20 $E = \frac{kq}{d^2}$ E into neg, away from pos



④ $E_{left\ chg} = \frac{(9\times10^9\ N m^2/c^2)(2\times10^{-3}\ C)}{(7\times10^{-6}\ m)^2} = 3.67\times10^{17}\ \frac{N}{C}$, pointing to L

④ $E_{right\ chg} = \frac{(9\times10^9\ \frac{N m^2}{c^2})(3.7\times10^{-3}\ C)}{(7\times10^{-6}\ m)^2} = 6.79\times10^{17}\ \frac{N}{C}$, pointing to L

④ E_{tot} @ middle $= (3.67 + 6.79)\times10^{17}\ N/C$, or $10.46\times10^{17}\ \frac{N}{C}$ to left

④ $F_{left} = E\cdot q = (3.67\times10^{17}\ \frac{N}{C})(1.3\times10^{-3}\ C) = 4.77\times10^{14}\ N$, to left b/c opp. attract

④ $F_{right} = (6.79\times10^{17}\ \frac{N}{C})(1.3\times10^{-3}\ C) = 8.83\times10^{14}\ N$, to left b/c same repel

④ $F_{tot} = (4.77 + 8.83)\times10^{14}\ N$, or $13.6\times10^{14}\ N$, to left

3 /8 E_{cons}: $E_i = \frac{1}{2}kx^2$ ② $E_f = \frac{1}{2}mv^2$ ②

$\frac{1}{2}kx^2 = \frac{1}{2}mv^2$ ②

$v = \sqrt{\frac{kx^2}{m}}$ ②

9 2 b, c 10 10 b, f 11 6 a, b, e

4 b $\omega = \frac{\Delta\theta}{t} = 45\frac{rev}{min}\left(\frac{1min}{60sec}\right)\left(\frac{2\pi rad}{1rev}\right) = 4.71\frac{rad}{sec}$ (2)

$v = r\omega = (7cm\ \frac{1m}{100cm})(4.71\frac{rad}{s}) = 0.33\frac{m}{s}$ (2) (2)

5 b
N-S poles make domains (2)
domains randomly aligned in non-mag material (2)
not randomly (2)

6 b 150 lbs on 2 heels so 75 lbs on one

$P = \frac{F}{A} = \frac{(75\ lb)(\frac{1kg}{2.2lb})(9.8\ m/s^2)}{(\pi(6mm\ \frac{1m}{1000mm})^2)}$ (2) (2) πr^2 = area of circle

$P = 2.96 \times 10^6\ \frac{N}{m^2}$ or Pa (2) units OR 5.92×10^6 if all weight on one heel

7 b
$W = \Delta KE$ or cons of E.
(3) $\frac{1}{2}mv^2$ = heat
$\frac{1}{2}(2520kg)\left(90\frac{km}{hr}\cdot\frac{1000m}{1km}\cdot\frac{1hr}{3600s}\right)^2 = 7.87 \times 10^5 J$
(3)

8 b
$PV = NkT$ $V = 12\ L$, constant
$\frac{P}{T} = \left(\frac{Nk}{V}\right)$ (2)
$\frac{P_i}{T_i} = \frac{P_f}{T_f}$ $P_f = \left(\frac{T_f}{T_i}\right)P_i$ (2) (2) $= \underline{1.01}\ P_i$

45°F = 280.37 K 50°F = 283.15 K (2) conversion