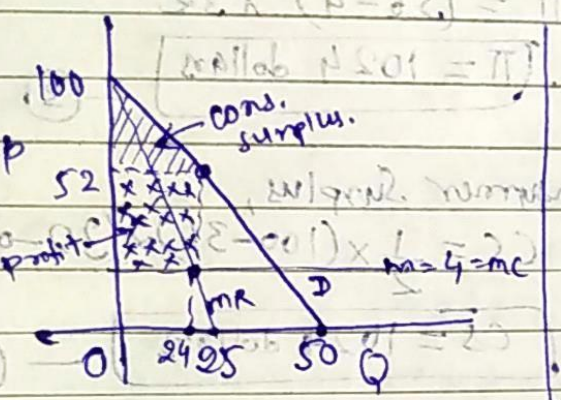
Q2 $P = 100 - 2Q$; and $m = 4$ = marginal cost = MC

(a)



$\therefore$ profit = π = R − C

$R = (100 - 2Q)Q = 100Q - 2Q^2$

$\therefore MR = 100 - 4Q$

$\therefore$ for max. profit, MR = MC

$\therefore 100 - 4Q = 4$

$4Q = 96$; $\boxed{Q = 24 \text{ units.}}$ — (3)

$\therefore \boxed{P = 52}$

$\therefore$ firm will produce 24 units.

$\therefore$ profit = R − C

where, $R - C = (P - m)Q = (52 - 4)(24)$

$\therefore \boxed{\text{profit} = 1152 \text{ dollar units.}}$ — (1)

Consumer surplus (C.S.) $= \frac{1}{2} \times (100 - 52) \times (24 - 0)$

$\therefore \boxed{C.S. = 576 \text{ dollars}}$ — (2)

$\therefore$ eqn (1), (2) & (3) are answers.

(b) We know that for Nash-Cournot Equilibrium,

for max^m profit, $q_1 = q_2 = \frac{a - m}{3b}$

and, $P = \frac{a + 2m}{3}$

where, $P = a - bQ$

$\therefore a = 100, b = 2$

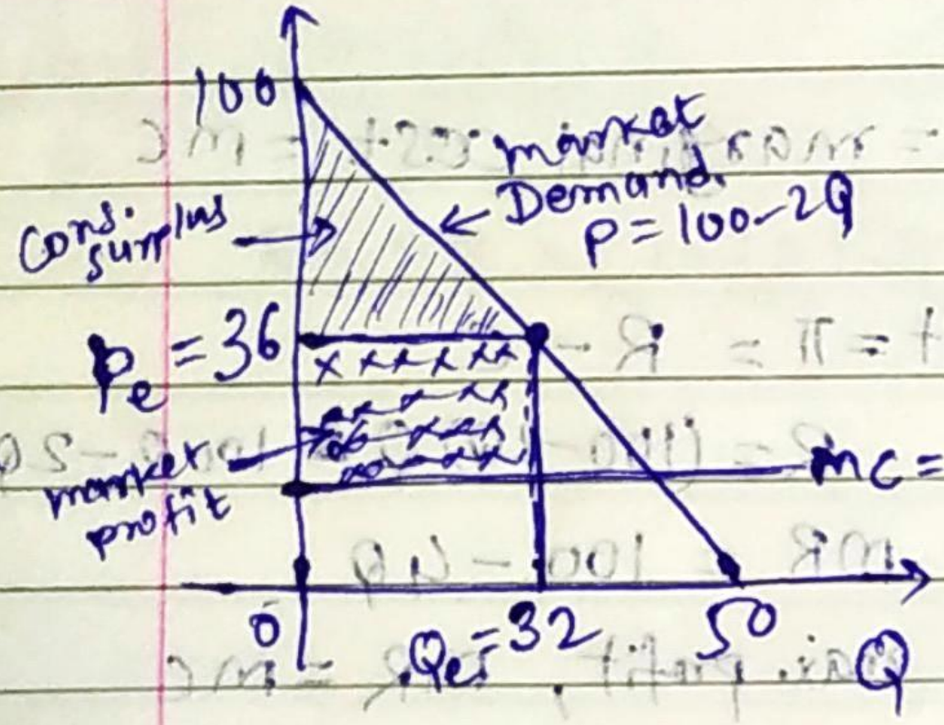
& $m = 4$

$\therefore q_1 = q_2 = \frac{100 - 4}{3(2)} = \frac{96}{6} = 16 = q_1 = q_2$

and $P = \frac{100 + 2(4)}{3}$

$\therefore \boxed{\text{Equilibrium Qty, } Q_e = q_1 + q_2 = 16 + 16 = 32 \text{ units}}$ — (1)

$\therefore \boxed{P_e = 36 \text{ (dollars)}}$ = equilibrium price — (2)



∴ market profit,

$\pi = (36 - 4) \times 32$

$\therefore \boxed{\pi = 1024 \text{ dollars}}$ — (3)

Consumer Surplus,

$CS = \frac{1}{2} \times (100 - 36) \times (32 - 0)$

$\rightarrow \boxed{CS = 1024 \text{ dollars.}}$ — (4)

∴ (1), (2), (3) & (4) are answers.