AREA BETWEEN CURVES

① $\int_0^4 (-x^3+2x^2+8x)dx \Rightarrow \frac{128}{3}u^2$

② $\int_{-3}^3 (-x^2+9)dx \Rightarrow 36u^2$

③ $A=(2,0)$ $\int_0^2 (x^3-4x^2+x+6)dx \Rightarrow \frac{22}{3}u^2$

④ $\int_0^1 (x^3-6x^2+4x+1)dx = \frac{5}{4}$ $\int_1^2 (x^3-6x^2+4x+1)dx = -\frac{13}{4}$

Total $= \frac{18}{4} = \frac{9}{2}u^2$

⑤ $\int_{-3}^3 32-2x^2-(14)dx \Rightarrow 72u^2$ $\int_{-2}^2 32-2x^2-(24)dx \Rightarrow \frac{64}{3}u^2$

$\therefore$ Shaded area $= \frac{152}{3}u^2$

⑥ $\int_1^3 (2x-\frac{1}{2}x^2-\frac{3}{2})dx \Rightarrow \frac{2}{3}u^2$ $\therefore \frac{2}{3}m^2$

⑦ $\int_{-2}^0 (x^3-x^2-4x+4)-(2x+4)\,dx \Rightarrow \frac{16}{3}u^2$

$\int_0^3 (2x+4)-(x^3-x^2-4x+4)dx \Rightarrow \frac{63}{4}u^2$

Total $= 21\frac{1}{12}u^2$

⑧ $\int_0^4 (4x-x^2)dx \Rightarrow \frac{32}{3}u^2$ $\therefore$ 3200m^2 of land.

b) $y=2x+c$. $y=y \rightarrow c=4$ (use $b^2-4ac=0$ for tangency).

$\int_0^2 (x^2-4x+4)dx \Rightarrow \frac{8}{3}u^2$ $\therefore$ 800m^2

⑨ a) $x=-1,\ x=2,\ x=4$

b) $\int_0^2 (x^3-5x^2+2x+8)dx = \frac{32}{3}u^3$

⑩ $\int_{-3}^3 (x^3+3x^2+2x+3)-(2x+3)\,dx \Rightarrow \frac{27}{4}u^2$