

$$3g) f(x) = 9 - 4x^2$$

$$\text{ii) } f'(2) = -16$$

$$\text{iii) } f(2) = -7$$

$$y + 7 = -16(x - 2)$$

$$y + 7 = -16x + 32$$

$$\underline{y = -16x + 25}$$

$$4/ \text{ c) } f(x) = x^2 + 3x + 2$$

$$f'(x) = 2x + 3$$

tangent is horizontal when $f'(x) = 0$

$$\text{ie } 2x + 3 = 0$$

$$\underline{x = -\frac{3}{2}}$$

$$\begin{aligned} 5h) \quad f(x) &= \frac{7}{2x^n} \\ &= \frac{7}{2} x^{-n} \end{aligned}$$

$$\begin{aligned} f'(x) &= -\frac{7n}{2} x^{-n-1} \\ &= \frac{-7n}{2x^{n+1}} \end{aligned}$$

$$\int f(x) = x^2 - 5x$$

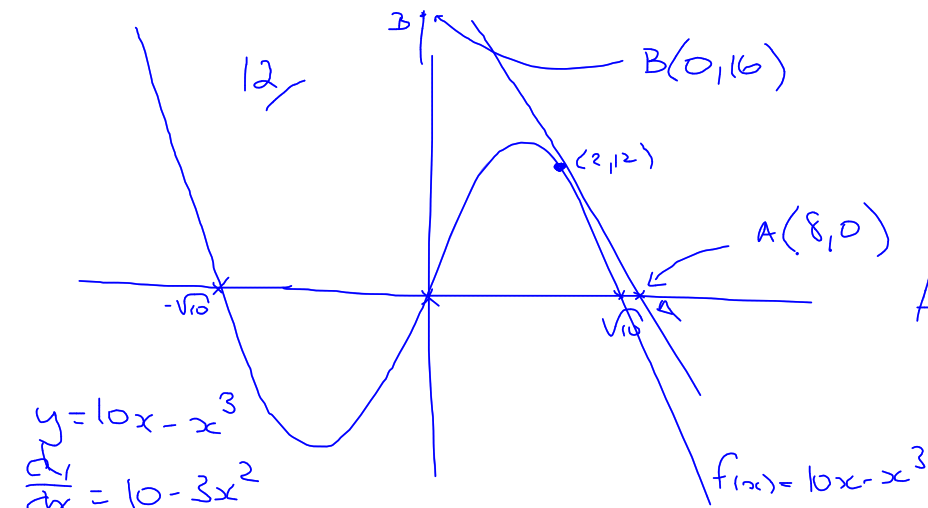
$$\frac{dy}{dx} = 1$$

$$2x - 5 = 1$$

$$2x = 6$$

$$x = 3$$

$$(3, -6)$$



$$AB^2 = 8^2 + 16^2$$

$$AB = \underline{8\sqrt{5}}$$

$$A_{\Delta AOB} = \frac{1}{2} \times 8 \times 16$$

$$= \underline{64 \text{ units}^2}$$

$$y = 10x - x^3$$

$$\frac{dy}{dx} = 10 - 3x^2$$

When $x = 2$, $\frac{dy}{dx} = 10 - 3(2)^2$

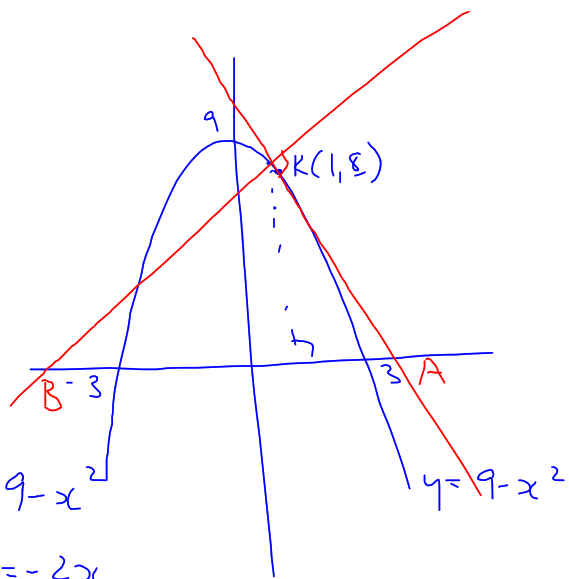
$$= -2$$

$$y - 12 = -2(x - 2)$$

$$y - 12 = -2x + 4$$

$$\underline{y = -2x + 16}$$

16/



$$y = 9 - x^2$$

$$\frac{dy}{dx} = -2x$$

$$\text{When } x = 1, \frac{dy}{dx} = -2$$

$$T: y - 8 = -2(x - 1)$$

$$y - 8 = -2x + 2$$

$$2x + y - 10 = 0$$

$$N: y - 8 = \frac{1}{2}(x - 1)$$

$$2y - 16 = x - 1$$

$$x - 2y + 15 = 0$$

$$A(5, 0) \quad B(-15, 0)$$

$$AB = 20 \text{ units}$$

$$\begin{aligned} \text{Area } \triangle AKB &= \frac{1}{2} \times 20 \times 8 \\ &= 80 \text{ units}^2 \end{aligned}$$

$$2k) \quad Q(k) = ak^2 - a^2k$$

$$Q'(k) = 2ak - a^2$$

$$Q'(a) = 2a^2 - a^2 \\ = a^2$$

$$Q'(0) = 0 - a^2 \\ = -a^2$$

$$\begin{aligned} & |Q'(0) - Q'(a)| \\ &= |-a^2 - a^2| \\ &= |-2a^2| \\ &= \underline{2a^2} \end{aligned}$$