Ch 4 Quadratics Test

1. Require Area > 3

$\therefore \frac{1}{2}x(13-2x) > 3$

$\therefore 13x - 2x^2 > 6$

$\therefore 2x^2 - 13x + 6 < 0$

$\therefore (2x-1)(x-6) < 0$

3 $\therefore \underline{\frac{1}{2} < x < 6}$

2. i. For tangency, must touch, so $Kx+2 = 4x^2 + 2x + 3$

$\therefore 4x^2 + (2-K)x + 1 = 0$

$\therefore$ "$b^2 - 4ac$" $= 0$ $\therefore (2-K)^2 - 16 = 0$

$\therefore 2-K = \pm 4$

4 $\therefore \underline{K = -2 \text{ or } 6}$

ii. $4x^2 + 2x + 3$

$= 4\left[x^2 + \frac{1}{2}x\right] + 3$

3 $= 4\left[\left(x+\frac{1}{4}\right)^2 - \frac{1}{16}\right] + 3 = \underline{4\left(x+\frac{1}{4}\right)^2 + \frac{11}{4}}$ [OR $2\frac{3}{4}$]

iii. If $4x^2 + 2x + 3$ meets the x-axis, then $y = 0$

But minimum value of $4\left(x+\frac{1}{4}\right)^2 + \frac{11}{4}$ is $\frac{11}{4}$

when $x = -\frac{1}{4}$.

2 Therefore it does not meet the x-axis