C1 Jan 2009

⑤ $(3k-2)x^2 + 8x + k = 0$

has no real roots

$a = (3k-2)$

$b = 8$

$c = k$

$b^2 - 4ac < 0$

$8^2 - 4(3k-2)k < 0$

$64 - 12k^2 + 8k < 0$

$12k^2 - 8k - 64 > 0$

NOTICE the change of Inequality because I have multiplied by a negative!

÷4

$3k^2 - 2k - 16 > 0$

$(3k-8)(k+2) > 0$

Critical Values

$k = \frac{8}{3}$ and $k = -2$.

So if $k < -2$ or $k > 8/3$

the inequality is satisfied