January 7th

$$_{8}x^{2}+4x+3 = {}_{16}x^{2}+5x+6$$

Since $8 = 2^3$ and $16=2^4$

LHS = $_{2}\ 3x^2+12x+9$

RHS = $_{2}\ 4x^2+20x+24$

Hence $3x^2+12x+9 = 4x^2+20x+24$

Re-arranging gives $x^2+8x+15 = 0$

The product of the 2 roots to this equation is therefore **15**

(You can factorise and solve to get x=-3 and x=-5 but this is unnecessary for this problem!)