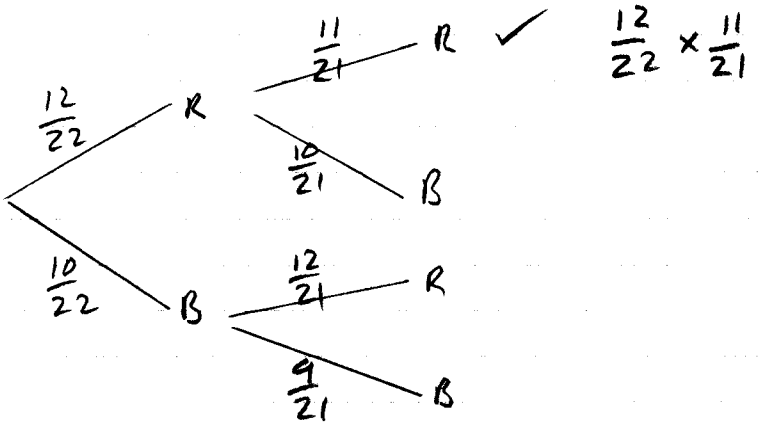
STATS 1 REVISION PROBABILITY (FROM OCR PAPERS)

9) i) 12 Red, 10 Black



$\frac{12}{22} \times \frac{11}{21}$ ✓

$$P(\text{Both Red}) = \frac{\cancel{12}^{4}}{\cancel{22}_{2}} \times \frac{11}{\cancel{21}_{7}} = \frac{4}{14} = \frac{2}{7}$$

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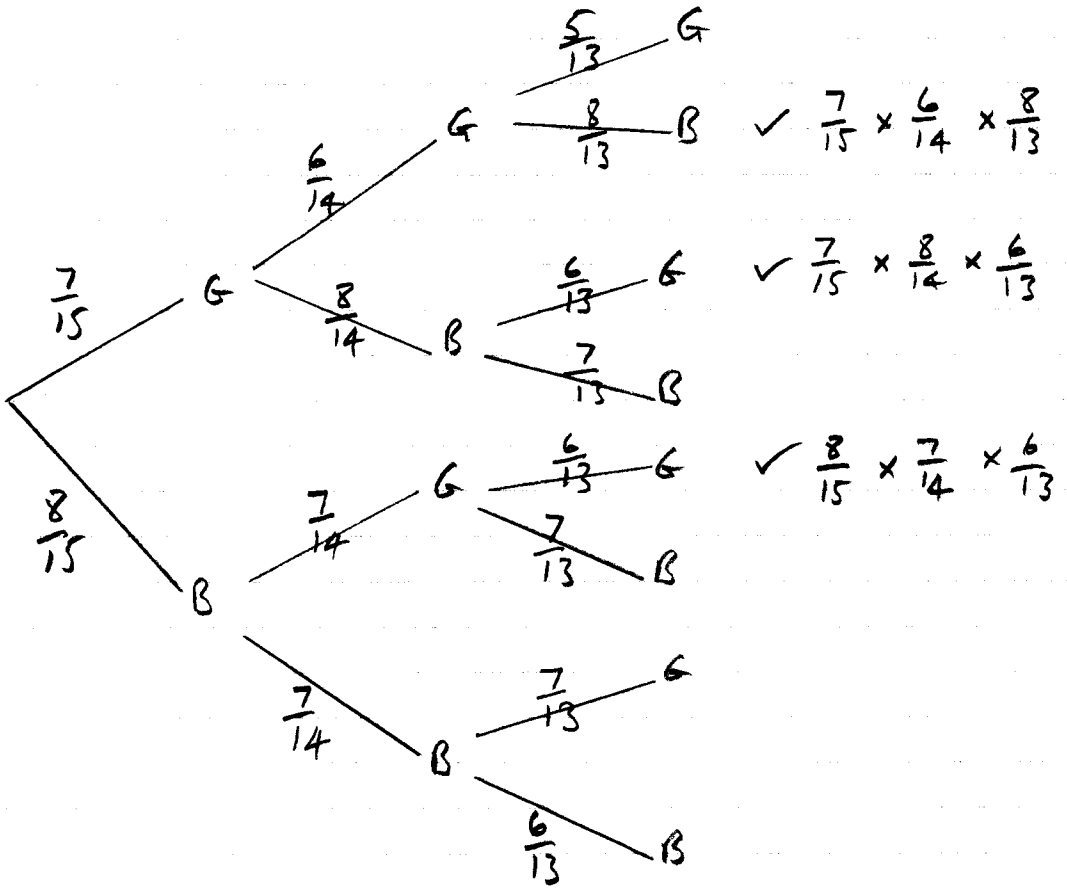
ii) 7 Green, 8 Blue



$\frac{7}{15} \times \frac{6}{14} \times \frac{8}{13}$ ✓

$\frac{7}{15} \times \frac{8}{14} \times \frac{6}{13}$ ✓

$\frac{8}{15} \times \frac{7}{14} \times \frac{6}{13}$ ✓

$$P(\text{Exactly 2 Green}) = \frac{7\times6\times8 + 7\times8\times6 + 8\times7\times6}{15\times14\times13} = \frac{1008}{2730} = 0.3692$$

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9) iii) Let number of yellow discs be n

Then $P(\text{Both yellow}) = \frac{n}{45} \times \frac{(n-1)}{44} = \frac{1}{15}$

$$\Rightarrow \quad n(n-1) = \frac{\cancel{45}^{3} \times 44}{\cancel{15}_{1}}$$

$$\Rightarrow \quad n^2 - n = 132$$

$$\Rightarrow \quad n^2 - n - 132 = 0$$

$$\Rightarrow \quad (n+11)(n-12) = 0$$

$$\Rightarrow \quad \cancel{n = -11} \text{ or } n = 12$$

initially 12 yellow discs