a) * $N = N_0 e^{kt}$

when $t=0$,

$N = 18$

$18 = N_0 e^{k(0)}$

$18 = N_0$

$\therefore N_0 = 18$

* $N = N_0 e^{kt}$ when $t=70$, $N=5000$

$5000 = 18 e^{k70}$

$71\frac{3}{7} = e^{k70}$

$\log_e 71\frac{3}{7} = k70 \log_e e$

$k = \frac{\log_e 71\frac{3}{7}}{70}$

$k \doteq 0.060981399.....$

$k = 0.0610$ (4 d.p.)

* Number in Nov. 2001

$t = 78$

$N = 18e^{0.0610 \times 78}$ (using memory in calc. for 'k')

$\doteq 2094.187442...$

$= 2094$ (nearest whole number)

$\therefore$ there will be 2094 koalas in Nov. 2001

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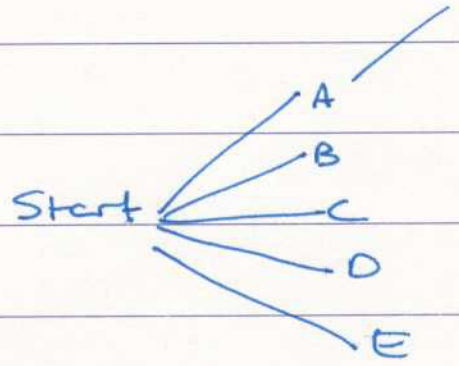
b i $P(\text{A drawn out first}) = \frac{1}{5}$



$P(\text{drawn in order ABCDE}) = P\left(\frac{1}{5} \times \frac{1}{4} \times \frac{1}{3} \times \frac{1}{2} \times \frac{1}{1}\right)$

$= \frac{1}{120}$

c) i

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