Problem Solving Week 5
Foundation:
John has half a litre of milk in a glass.

The glass is currently half full with milk and half empty.

How many millilitres of the milk will John have to drink to make the 'full to empty' ratio of the glass 2:3?

Higher:
There are *y* counters in a bag.

8 of the counters are Red and the rest of the counters are Blue.

Counters are taken at random from the bag.

Match each event (1-4) with the correct probability below (a-d).

You must explain your reasoning.

Event

(1)	(2)	(3)	(4)
The first 3 counters are taken out and none of them are replaced. **All 3 counters are Red.**	*A Blue counter is chosen with the first pick.*	*3 counters are taken one at a time. Their colours are noted and each counter is replaced in the bag before the next is chosen.* **The counters chosen are Red, Blue and Red**	*Two counters are taken at random and not replaced.* **Both counters are the same colour.**

Probability

(a)	(b)	(c)	(d)
$\left(\dfrac{8}{y}\right)^2 \times \dfrac{y-8}{y}$	$\dfrac{8}{y} \times \dfrac{7}{y-1} \times \dfrac{6}{y-2}$	$\dfrac{y-8}{y}$	$\left(\dfrac{8}{y} \times \dfrac{7}{y-1}\right) + \left(\dfrac{y-8}{y} \times \dfrac{y-9}{y-1}\right)$

Reasoning

(1) _____

_____

(2) _____

_____

(3) _____

_____

(4) _____

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