

A total of 144 people decided which Science they preferred.

The number of females who chose Chemistry was  $2y$ .

The number of males who chose Chemistry was  $3x$ .

The total number for Chemistry was 53.

The total number of males was  $4x$ , the total number of females was  $10y$ .

What is the probability that a person picked at random is a female that prefers Biology?

	Biology	Chemistry	Total
Male	$x$	$3x$	$4x$
Female	$8y$	$2y$	$10y$
Total	$91$	$53$	$144$

	Biology	Chemistry	Total
Male	11	33	44
Female	80	20	100
Total	91	53	144

Solve simultaneously –

$$\begin{aligned} x + 8y &= 91 \\ 3x + 2y &= 53 \quad \times 3 \end{aligned}$$

$$\begin{aligned} 12x + 8y &= 212 \\ - \quad x + 8y &= 91 \\ \hline 11x &= 121 \\ x &= 11 \end{aligned}$$

$$\begin{aligned} (11) + 8y &= 91 \\ 8y &= 80 \\ y &= 10 \end{aligned}$$

$$P(\text{Female and Biology}) = \frac{80}{144}$$