

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 –

$$x + 8y = 91$$

$$3x + 2y = 53 \quad \times 3$$

$$12x + 8y = 212$$

$$- \quad x + 8y = 91$$

$$\hline 11x = 121$$

$$x = 11$$

$$(11) + 8y = 91$$

$$8y = 80$$

$$y = 10$$

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