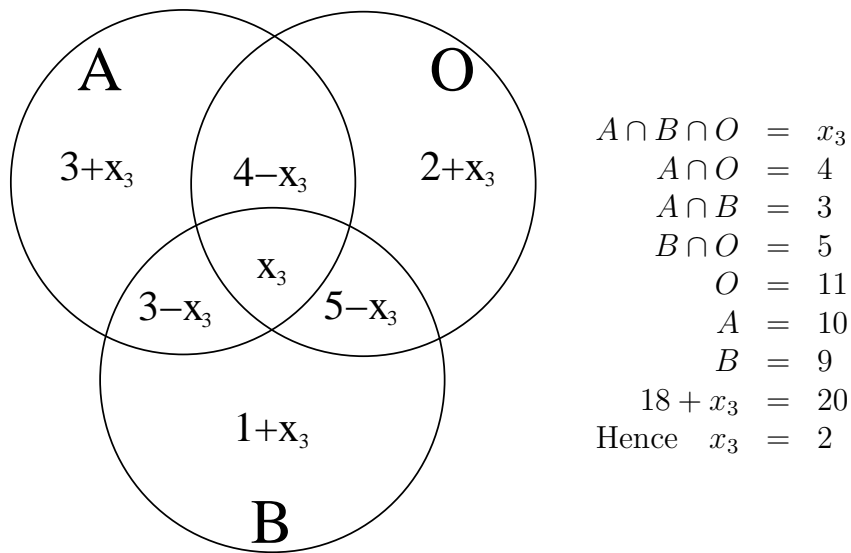## Question

A group of 20 fussy children at a nursery are unwilling to eat the fruit put in front of them.. The exasperated nursery assistant observes that 10 children will eat apples, 11 will eat oranges, 9 will eat bananas, 4 will eat apples and oranges, 3 eat apples and bananas, and 5 will eat oranges and bananas. Draw a Venn diagram showing fruit acceptance. How many of the unpleasant small people will eat all three fruit?

## Answer

Hidden assumption that all children will eat at least one fruit.



$$
\begin{aligned}
A \cap B \cap O &= x_3 \\
A \cap O &= 4 \\
A \cap B &= 3 \\
B \cap O &= 5 \\
O &= 11 \\
A &= 10 \\
B &= 9 \\
18 + x_3 &= 20 \\
\text{Hence} \quad x_3 &= 2
\end{aligned}
$$

Hence only two children eat all three fruit.