The ratio of girls to boys at a party was 6:7.
After 3 girls arrived and 3 boys arrived, the ratio of girls to boys becomes 43:50. Find the number of children to start.

Method 1

$6:7 \xrightarrow{\times 7} 42:49$

$43:50$

$\square = 3$

$\therefore \quad (42+49) \times 3 = \boxed{273}$

Method 2

$$\frac{6x+3}{7x+3} = \frac{43}{50}$$

$$50(6x+3) = 43(7x+3)$$
$$300x + 150 = 301x + 129$$
$$21 = x$$

$\therefore \quad 6x + 7x = 13 \times 21 = \boxed{273}$

The ratio of girls to boys at a party was 5:7.
After 6 girls left and 11 boys arrived, the ratio of girls to boys becomes 2:3. Find the number of children at the end.

x is the # of groups of girls/boys at the start (5 girls, 7 boys)

$$\frac{5x-6}{7x+11} = \frac{2}{3}$$

$$3(5x-6) = 2(7x+11)$$
$$15x - 18 = 14x + 22$$
$$x = 40$$

$\therefore \quad \underbrace{5(40)-6}_{\text{girls}} + \underbrace{7(40)+11}_{\text{boys}}$

$= \boxed{485}$