Exercise 145

In the following exercises, simplify.

$$\frac{120}{252}$$

Solution

Write out the prime factorizations of 120 and 252.

$$\begin{aligned} 120 &= 2 \times 60 \\ &= 2 \times 2 \times 30 \\ &= 2 \times 2 \times 2 \times 15 \\ &= 2 \times 2 \times 2 \times 3 \times 5 \end{aligned}$$

$$\begin{aligned} 252 &= 2 \times 126 \\ &= 2 \times 2 \times 63 \\ &= 2 \times 2 \times 9 \times 7 \\ &= 2 \times 2 \times 3 \times 3 \times 7 \end{aligned}$$

Therefore,

$$\frac{120}{252} = \frac{\cancel{2} \times \cancel{2} \times 2 \times \cancel{3} \times 5}{\cancel{2} \times \cancel{2} \times \cancel{3} \times 3 \times 7} = \frac{2 \times 5}{3 \times 7} = \frac{10}{21}.$$