

2nd exercise

$$\begin{aligned} 1) \quad a &= \left[\frac{7}{18} + \frac{2}{7} - \left(1 - \frac{5}{2} \right)^{-2} \right]^2 \\ &= \left[\frac{1}{9} - \left(\frac{-3}{2} \right)^{-2} \right]^2 \\ &= \left[\frac{1}{9} - \left(-\frac{2}{3} \right)^2 \right]^2 \\ &= \left[\frac{1-4}{9} \right]^2 \\ &= \left[\frac{-3}{9} \right]^2 \\ &= \frac{9 \div 9}{81 \div 9} = \frac{1}{9} \text{ (proved) } \checkmark \end{aligned}$$

a is a rational number since it can be written in the form of $\frac{a}{b}$ where a is an integer and b is a non-zero integer.

$$\begin{aligned} a &= \frac{1}{9} = 0.\overline{1} \\ &= 1.\overline{1} \times 10^{-1} \end{aligned}$$

$$\begin{aligned} 2) \quad b &= \frac{2-\sqrt{3}}{(5-2\sqrt{6})(5+2\sqrt{6})} \\ &= \frac{2-\sqrt{3}}{5^2 - (2\sqrt{6})^2} = \frac{2-\sqrt{3}}{25-24} = 2-\sqrt{3} \\ &= \frac{(2-\sqrt{3})(2+\sqrt{3})}{1(2+\sqrt{3})} = \frac{4+2\sqrt{3}-2\sqrt{3}-3}{2+\sqrt{3}} \\ &= \frac{1}{2+\sqrt{3}} \text{ (shown) } \checkmark \end{aligned}$$