

## Puissances et racines

### Exercice 1.

$$\begin{array}{l} 10 \cdot 2, \overline{8} = 28,88888888\dots \\ \text{a) } -1 \cdot 2, \overline{8} = 2,88888888\dots \\ \hline 9 \cdot 2, \overline{8} = 26 \end{array}$$

$$\Rightarrow 2, \overline{8} = \boxed{\frac{26}{9}}$$

$$\begin{array}{l} 10 \cdot 3, \overline{5} = 35,55555555\dots \\ -1 \cdot 3, \overline{5} = 3,55555555\dots \\ \hline 9 \cdot 3, \overline{5} = 32 \end{array}$$

$$\Rightarrow 3, \overline{5} = \boxed{\frac{32}{9}}$$

$$\begin{array}{l} 100 \cdot 2, \overline{42} = 242,42424242\dots \\ \text{b) } -1 \cdot 2, \overline{42} = 2,42424242\dots \\ \hline 99 \cdot 2, \overline{42} = 240 \end{array}$$

$$\Rightarrow 2, \overline{42} = \frac{240}{99} = \boxed{\frac{80}{33}}$$

$$\begin{array}{l} 100 \cdot 2, \overline{12} = 212,12121212\dots \\ -1 \cdot 2, \overline{12} = 2,12121212\dots \\ \hline 99 \cdot 2, \overline{12} = 210 \end{array}$$

$$\Rightarrow 2, \overline{12} = \frac{210}{99} = \boxed{\frac{70}{33}}$$

### Exercice 2.

$$\text{a) } \frac{3}{23} \cdot \frac{(8+15)}{12} = \frac{3}{23} \cdot \frac{23}{12} = \boxed{\frac{1}{4}}$$

$$\frac{3}{26} \cdot \frac{(3+10)}{12} = \frac{3}{26} \cdot \frac{13}{12} = \boxed{\frac{1}{8}}$$

$$\begin{aligned} \text{b) } \frac{8}{3} \div \left( \frac{88}{25} \cdot \frac{35}{33} \right) - \frac{(33-28)}{21} \\ = \frac{8}{3} \div \frac{56}{15} - \frac{5}{21} = \frac{8}{3} \cdot \frac{15}{56} - \frac{5}{21} \\ = \frac{5}{7} - \frac{5}{21} = \frac{15-5}{21} = \boxed{\frac{10}{21}} \end{aligned}$$

$$\begin{aligned} \frac{7}{10} \div \left( \frac{77}{24} \cdot \frac{16}{55} \right) - \frac{(32+3)}{20} \\ = \frac{7}{10} \div \frac{14}{15} - \frac{7}{4} = \frac{7}{10} \cdot \frac{15}{14} - \frac{7}{4} \\ = \frac{3}{4} - \frac{7}{4} = \boxed{-1} \end{aligned}$$

$$\text{c) } (-2) \cdot (-7) - 5 \cdot 1 = 14 - 5 = \boxed{9}$$

$$(-2) \cdot (-8) - 9 \cdot 1 = 16 - 9 = \boxed{7}$$

$$\text{d) } 10 - 24 + 1 = \boxed{-13}$$

$$4 - 30 - 2 = \boxed{-28}$$

**Exercice 3.**

$$\text{a) } \frac{3}{4} \cdot 40 = \boxed{30 \text{ km}}$$

$$\frac{3}{4} \cdot 60 = \boxed{45 \text{ km}}$$

$$\text{b) } v = \frac{5}{4} \cdot 40 = 50 \text{ km/h}$$

$$v = \frac{5}{6} \cdot 60 = 50 \text{ km/h}$$

$$t = \frac{30}{50} = \boxed{\frac{3}{5} \text{ h} = 36 \text{ min}}$$

$$t = \frac{45}{50} = \boxed{\frac{9}{10} \text{ h} = 54 \text{ min}}$$

**Exercice 4.**

$$\text{a) } \frac{4}{7} + \frac{1}{5} = \frac{20 + 7}{35} = \frac{27}{35} \Rightarrow \frac{8}{35} \text{ (indifférentes)}$$

$$\frac{3}{5} + \frac{1}{6} = \frac{18 + 5}{30} = \frac{23}{30} \Rightarrow \frac{7}{30} \text{ (indifférentes)}$$

$$\Rightarrow 16 \div \frac{8}{35} = 16 \cdot \frac{35}{8} = \boxed{70 \text{ personnes}}$$

$$\Rightarrow 21 \div \frac{7}{30} = 21 \cdot \frac{30}{7} = \boxed{90 \text{ personnes}}$$

$$\text{b) } 70 \cdot \frac{4}{7} = \boxed{40 \text{ personnes}}$$

$$90 \cdot \frac{3}{5} = \boxed{54 \text{ personnes}}$$