

1. Laske $-5 \cdot (-12) : (-3)$.

$$-5 \cdot (-12) : (-3)$$

$$= 60 : (-3)$$

$$= -20$$

Laske päässälaskuna.

a) $98 + (79 + 102)$ b) $97 \cdot 251 + 251 \cdot 3$ c) $4 \cdot 258$

a) $98 + (79 + 102)$

$$= 98 + (102 + 79)$$

$$= (98 + 102) + 79$$

$$= 200 + 79$$

$$= 279$$

Vaihdantalaki: lukujen 79 ja 102 järjestys voidaan vaihtaa.

Liitântälaki: summa $98 + 102$ voidaan laskea ensin.

Laske päässälaskuna.

a) $98 + (79 + 102)$ b) $97 \cdot 251 + 251 \cdot 3$ c) $4 \cdot 258$

b) $97 \cdot 251 + 251 \cdot 3$

$$= 251 \cdot 97 + 251 \cdot 3$$

$$= 251 \cdot (97 + 3)$$

$$= 251 \cdot 100$$

$$= 25\ 100$$

Vaihdantalaki: lukujen 97 ja 251 järjestys voidaan vaihtaa.

Osittelulaki: luku 251 voidaan erottaa yhteiseksi tekijäksi.

Lasketaan summa $97 + 3$.

c) $4 \cdot 258$

$$= 4 \cdot (250 + 8)$$

$$= 4 \cdot 250 + 4 \cdot 8$$

$$= 1\ 000 + 32$$

$$= 1\ 032$$

Puretaan luku 258 summaksi $250 + 8$.

Osittelulaki: yhteenlaskettavat voidaan kertoa erikseen luvulla 4.

8. Laske.

a) $21 - 18 : 3$

c) $5 - 4 \cdot (2 - 6 : 3)$

a) $21 - 18 : 3$

$$= 21 - 6$$

$$= 15$$

b) $-3 \cdot 8 + 2$

$$= -24 + 2$$

$$= -22$$

b) $-3 \cdot 8 + 2$

d) $10 : (-22 + 6 \cdot 4) - 9$

c) $5 - 4 \cdot (2 - 6 : 3)$

$$= 5 - 4 \cdot (2 - 2)$$

$$= 5 - 4 \cdot 0$$

$$= 5 - 0$$

$$= 5$$

d) $10 : (-22 + 6 \cdot 4) - 9$

$$= 10 : (-22 + 24) - 9$$

$$= 10 : 2 - 9$$

$$= 5 - 9$$

$$= -4$$

26. Laske.

a) $\frac{6}{5} + \frac{1}{4}$

b) $\frac{15}{12} - \frac{4}{3}$

c) $3\frac{1}{2} - 1\frac{2}{3}$

d) $5 - \frac{3}{4}$

a) $\overset{4)}{\frac{6}{5}} + \overset{5)}{\frac{1}{4}} = \frac{24}{20} + \frac{5}{20} = \frac{24+5}{20} = \frac{29}{20}$

b) $\frac{15}{12} - \overset{4)}{\frac{4}{3}} = \frac{15}{12} - \frac{16}{12} = \frac{15-16}{12} = \frac{-1}{12} = -\frac{1}{12}$

c) $3\frac{1}{2} - 1\frac{2}{3} = \frac{3 \cdot 2 + 1}{2} - \frac{1 \cdot 3 + 2}{3} = \overset{3)}{\frac{7}{2}} - \overset{2)}{\frac{5}{3}} = \frac{21}{6} - \frac{10}{6} = \frac{11}{6}$

d) $5 - \frac{3}{4} = \overset{4)}{\frac{5}{1}} - \frac{3}{4} = \frac{20}{4} - \frac{3}{4} = \frac{20-3}{4} = \frac{17}{4}$

27. Laske.

a) $\frac{6}{5} \cdot \frac{1}{4}$ b) $\frac{15}{12} \cdot \frac{4}{3}$ c) $1\frac{3}{8} \cdot (-\frac{1}{4})$ d) $5 \cdot \frac{3}{4}$

a) $\frac{\overset{3}{\cancel{6}}}{5} \cdot \frac{1}{\underset{2}{\cancel{4}}} = \frac{3 \cdot 1}{5 \cdot 2} = \frac{3}{10}$

b) $\frac{\overset{5}{\cancel{15}}}{\underset{3}{\cancel{12}}} \cdot \frac{\overset{1}{\cancel{4}}}{\underset{1}{\cancel{3}}} = \frac{5 \cdot 1}{3 \cdot 1} = \frac{5}{3}$

c) $1\frac{3}{8} \cdot (-\frac{1}{4}) = \frac{11}{8} \cdot (-\frac{1}{4}) = -\frac{11 \cdot 1}{8 \cdot 4} = -\frac{11}{32}$

d) $5 \cdot \frac{3}{4} = \frac{5 \cdot 3}{1 \cdot 4} = \frac{5 \cdot 3}{1 \cdot 4} = \frac{15}{4}$

30. Laske lukujen $-\frac{2}{5}$ ja $-\frac{5}{12}$

a) summa b) erotus c) tulo d) osamäärä.

30. a) $-\frac{2}{5} + (-\frac{5}{12}) = -\overset{12)}{\frac{2}{5}} - \overset{5)}{\frac{5}{12}} = -\frac{24}{60} - \frac{25}{60} = -\frac{49}{60}$

b) $-\frac{2}{5} - (-\frac{5}{12}) = -\overset{12)}{\frac{2}{5}} + \overset{5)}{\frac{5}{12}} = -\frac{24}{60} + \frac{25}{60} = \frac{1}{60}$

c) $-\frac{2}{5} \cdot (-\frac{5}{12}) = \frac{\overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{5}}}{\underset{1}{\cancel{5}} \cdot \underset{6}{\cancel{12}}} = \frac{1}{6}$

d) $-\frac{2}{5} : (-\frac{5}{12}) = -\frac{2}{5} \cdot (-\frac{12}{5}) = \frac{2 \cdot 12}{5 \cdot 5} = \frac{24}{25}$

32. Laske.

$$\begin{array}{ll} \text{a)} -2 + 5 : \frac{1}{10} & \text{b)} \frac{14}{15} : \frac{7}{5} - \frac{1}{3} \cdot 7 \\ \text{c)} \frac{15+9}{5+3} \cdot \frac{5-3}{15-9} & \text{d)} \left(2 + \frac{2}{3}\right) : \left(1 - \frac{5}{3}\right) \end{array}$$

$$\text{a)} -2 + 5 : \frac{1}{10} = -2 + \frac{5}{1} : \frac{1}{10} = -2 + \frac{5 \cdot 10}{1 \cdot 1} = -2 + \frac{5 \cdot 10}{1} = -2 + \frac{50}{1} = -2 + 50 = 48$$

$$\text{b)} \frac{14}{15} : \frac{7}{5} - \frac{1}{3} \cdot 7 = \frac{14}{15} \cdot \frac{5}{7} - \frac{1}{3} \cdot \frac{7}{1} = \frac{\overset{2}{\cancel{14}} \cdot \overset{1}{\cancel{5}}}{\underset{3}{\cancel{15}} \cdot \underset{1}{\cancel{7}}} - \frac{1 \cdot 7}{3 \cdot 1} = \frac{2}{3} - \frac{7}{3} = -\frac{5}{3}$$

$$\text{c)} \frac{15+9}{5+3} \cdot \frac{5-3}{15-9} = \frac{24}{8} \cdot \frac{2}{6} = \frac{\overset{3}{\cancel{24}} \cdot \overset{1}{\cancel{2}}}{\underset{1}{\cancel{8}} \cdot \underset{3}{\cancel{6}}} = \frac{3}{3} = 1$$

$$\text{d)} \left(2 + \frac{2}{3}\right) : \left(1 - \frac{5}{3}\right) = \left(\frac{6}{3} + \frac{2}{3}\right) : \left(\frac{3}{3} - \frac{5}{3}\right) = \frac{8}{3} : \left(-\frac{2}{3}\right) = \frac{8}{3} \cdot \left(-\frac{3}{2}\right) = -\frac{\overset{4}{\cancel{8}} \cdot \overset{1}{\cancel{3}}}{\underset{1}{\cancel{3}} \cdot \underset{1}{\cancel{2}}} = -\frac{4}{1} = -4$$

40. Laske kolme seitsemäsosaa lukujen a ja b tulosta, kun

$$\text{a)} a = -6 \text{ ja } b = \frac{4}{3} \quad \text{b)} a = \frac{35}{12} \text{ ja } b = \frac{4}{5}.$$

$$\text{40. a)} \frac{3}{7} ab = \frac{3}{7} \cdot (-6) \cdot \frac{4}{3} = \frac{24}{7}$$

$$\text{b)} \frac{3}{7} ab = \frac{3}{7} \cdot \frac{35}{12} \cdot \frac{4}{5} = 1$$

3. Luvun $1\frac{3}{5}$ käänteisluku on

a) $-1\frac{3}{5}$

b) $1\frac{5}{3}$

c) $\frac{5}{8}$.

4. Lausekkeen $\frac{4}{9} : (-\frac{1}{2})$ arvo on

a) $-\frac{2}{9}$

b) $-\frac{9}{8}$

c) $-\frac{8}{9}$.

7. Minkä lausekkeen arvo on -9 ?

a) $(-3)^2$

b) -3^2

c) 3^{-2}

8. Mikä on lausekkeen 2^{-3} arvo?

a) -8

b) $-\frac{1}{8}$

c) $\frac{1}{8}$

9. Lauseke $(-2a^4)^3$ voidaan sieventää muotoon

a) $8a^{12}$

b) $-8a^{12}$

c) $8a^7$.