

21 Murtolukulausekkeita

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$$\begin{array}{llll}
 \text{a)} \frac{3}{8} \cdot \left(\frac{3}{4} - \frac{1}{24} \right) & \text{b)} \left(\frac{4}{8} - \frac{1}{8} \right) : 3 & \text{c)} \left(\frac{2}{6} - \frac{1}{6} \right) : \frac{5}{6} & \text{d)} \frac{5}{2} : \left(\frac{7}{4} - \frac{3}{2} \right) \\
 = \frac{3}{8} \cdot \left(\frac{3-1}{4} \right) & = \left(\frac{4-1}{8} \right) : \frac{3}{1} & = \frac{1}{6} : \frac{5}{6} & = \frac{5}{2} : \left(\frac{7}{4} - \frac{6}{4} \right) \\
 = \frac{3}{48} \cdot \frac{2^1}{4} & = \frac{3}{8} \cdot \frac{1}{3}, & = \frac{1}{6} \cdot \frac{6}{5} & = \frac{5}{2} : \frac{1}{4} \\
 = \frac{3}{16} & = \frac{1}{8} & = \frac{1}{5} & = \frac{5}{2} \cdot \frac{4^2}{1} \\
 & & & = 10
 \end{array}$$

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$$\begin{array}{lll}
 \text{a)} \left(\frac{1}{9} \right)^2 & \text{b)} \left(\frac{4}{5} \right)^2 & \text{c)} \left(1\frac{3}{4} \right)^2 \\
 = \frac{1}{9} \cdot \frac{1}{9} & = \frac{4}{5} \cdot \frac{4}{5} & = \left(\frac{7}{4} \right)^2 \\
 = \frac{1}{81} & = \frac{16}{25} & = \frac{7}{4} \cdot \frac{7}{4} \\
 & & = \frac{49}{16} \\
 & & = 3\frac{1}{16}
 \end{array}$$

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$$\begin{array}{lll}
 \text{a)} \cancel{\frac{3}{2} \cdot \frac{2}{10} \cdot \frac{7}{10}} & \text{a)} \frac{3}{2} \cdot \frac{2}{18} - \frac{7}{10} & \text{b)} \frac{7}{4} + \frac{5}{8} \cdot \frac{5}{2} \\
 = \cancel{\frac{3}{2} \cdot \frac{1}{5} \cdot \frac{7}{10}} & = \frac{1}{10} - \frac{7}{10} & = \frac{7}{4} + \frac{5}{8} \cdot \frac{2}{5}, \\
 = \cancel{\frac{5}{30} \cdot \frac{2}{30}} & = -\frac{6}{10} & = \frac{7}{4} + \frac{1}{4} \\
 = \cancel{-\frac{1}{20}} & = -\frac{3}{5} & = \frac{8}{4} = 2
 \end{array}$$

$$\begin{aligned}
 \text{c)} \frac{1}{2} \cdot \frac{3}{4} : 1\frac{1}{2} & \quad \text{d)} \frac{1}{3} : \frac{1}{6} \cdot \frac{4}{7} \\
 = \frac{3}{8} : \frac{3}{2} & = \frac{1}{3} \cdot \frac{6}{1} \cdot \frac{4}{7} \\
 = \frac{3}{8} \cdot \frac{2^1}{3} & = \frac{8}{7} \\
 = \frac{1}{4} & = 1\frac{1}{7}
 \end{aligned}$$

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kaikki postimerkit	
$\frac{1}{3}$ suom.	ulkom.

$\frac{3}{4}$
luonto

$$\text{a)} \text{ ulkomaalaisia } 1 - \frac{1}{3} = \frac{2}{3}$$

$$\begin{aligned}
 \text{b)} \text{ suomalaiset luontolaihuiset} \\
 \frac{3}{4}, \frac{1}{3}, = \frac{1}{4}
 \end{aligned}$$

Harjoittele
S.49

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255 a) $\frac{1}{2} : \frac{4}{5} - \frac{7}{8}$

$$\begin{aligned} &= \frac{1}{2} \cdot \frac{5}{4} - \frac{7}{8} \\ &= \frac{5}{8} - \frac{7}{8} \\ &= -\frac{2}{8} \\ &= -\frac{1}{4} \end{aligned}$$

b) $6 \cdot \frac{1}{4} - \frac{1}{2}$

$$\begin{aligned} &= \frac{6}{4} - \frac{1}{2} \\ &= \frac{6}{4} - \frac{2}{4} \\ &= \frac{4}{4} \\ &= 1 \end{aligned}$$

c) $-\frac{2}{7} : 1\frac{1}{7} + \frac{3}{4}$

$$\begin{aligned} &= -\frac{2}{7} \cdot \frac{8}{7} + \frac{3}{4} \\ &= -\frac{2}{7} \cdot \frac{7}{8} + \frac{3}{4} \\ &= -\frac{1}{4} + \frac{3}{8} \\ &= \frac{2}{4} \\ &= \frac{1}{2} \end{aligned}$$

d) $\frac{15}{16} + \frac{14}{8} : 4$

$$\begin{aligned} &= \frac{15}{16} + \frac{14}{8} \cdot \frac{1}{4} \\ &= \frac{15}{16} + \frac{7}{16} \end{aligned}$$

~~$= \frac{15+7}{16} = \frac{22}{16}$~~

$$= \frac{29}{16}$$

$$\begin{aligned} &= 1\frac{13}{16} \\ &= 1\frac{3}{8} \end{aligned}$$

e) $8 - 6 \cdot (3\frac{1}{2} - 2\frac{1}{3})$

$$\begin{aligned} &= 8 - 6 \cdot \left(\frac{7}{2} - \frac{7}{3} \right) \\ &= 8 - 6 \cdot \left(\frac{21}{6} - \frac{14}{6} \right) \\ &= 8 - 6 \cdot \frac{7}{6} \\ &= 8 - \frac{42}{6} \\ &= 8 - 7 \\ &= 1 \end{aligned}$$

f) $\left(\frac{2}{5} + \frac{3}{10} \right) \cdot \left(-\frac{4}{7} \right)$

$$\begin{aligned} &= \left(\frac{4}{10} + \frac{3}{10} \right) \cdot \left(-\frac{4}{7} \right) \\ &= -\frac{7}{10} \cdot \frac{4}{7} \\ &= -\frac{4}{10} \\ &= -\frac{2}{5} \end{aligned}$$

NERIA

Sovella)
s.49

21 Murtolukulausekkeita

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PERINTÖ		
Liisa	Lauri	
$\frac{2}{5}$	$\frac{1}{3}$	
$\frac{3}{4}$	$\frac{1}{4}$	

PR Unicef

a) Avustusjärjestöt saivat $1 - \frac{2}{5} - \frac{1}{3}$

$$\begin{aligned}
 &= 1 - \frac{6}{15} - \frac{5}{15} \\
 &= 1 - \frac{11}{15} \\
 &= \frac{4}{15}
 \end{aligned}$$

b) Punainen risti sai $\frac{3}{4} \cdot \frac{4}{18} = \frac{1}{5}$

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Jonna	liro	Hanna
$\frac{1}{3}$	$\frac{1}{3}$	

$\frac{1}{2}$ $\frac{1}{5}$ loput
Jonna liro Jonna

a) Jonna: $\frac{1}{3} + \frac{1}{2} \cdot \frac{1}{3} = \frac{1}{3} + \frac{1}{6} = \frac{2}{6} + \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$

liro: $\frac{1}{3} + \frac{1}{5} \cdot \frac{1}{3} = \frac{1}{3} + \frac{1}{15} = \frac{5}{15} + \frac{1}{15} = \frac{6}{15} = \frac{2}{5}$

Hanna: $1 - \frac{1}{2} - \frac{2}{5} = 1 - \frac{5}{10} - \frac{4}{10} = \frac{1}{10}$

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a) kahta lajia harrastaa $\frac{23}{100}$
(lue kurvasta)

b) korkeintaan kahta lajia

$$\begin{aligned}
 &= 1 \text{ laji} + 2 \text{ lajia} \\
 &= \frac{11}{50} + \frac{23}{100} = \frac{22}{100} + \frac{23}{100} = \frac{45}{100} = \frac{9}{20}
 \end{aligned}$$

c) vähintään kahta lajia

$$\begin{aligned}
 &= 2 \text{ lajia} + 3 \text{ lajia} + 4 \text{ lajia} \\
 &= \frac{23}{100} + \frac{6}{25} + \frac{31}{100} = \frac{23+24+31}{100} = \frac{78}{100} = \frac{39}{50}
 \end{aligned}$$

d) ainakin 3 lajia

$$= 1 - \text{kork. 2 lajia} = 1 - \frac{9}{20} = \frac{11}{20}$$