1.

a.) $3 \cdot \left(\frac{8}{9}\right)^2 = 3 \cdot \frac{64}{81} = \frac{\cancel{3}^{1} \cdot 64}{\cancel{81}_{27}} = \underline{\underline{\frac{64}{27}}}$ ½ $2\frac{10}{27}$

b.) $\frac{9}{4 \cdot \frac{8}{9}} = \frac{9}{\frac{32}{9}} = \frac{9}{1} : \frac{32}{9} = \frac{9}{1} \cdot \frac{9}{32} = \underline{\underline{\frac{81}{32}}}$ ½ $2\frac{17}{32}$

c.) $\left(8 - \frac{8}{9}\right)^2 = \left(\frac{72}{9} - \frac{8}{9}\right)^2 = \left(\frac{64}{9}\right)^2 = \underline{\underline{\frac{4'096}{81}}}$ ½ $50\frac{46}{81}$

d.) $3 \cdot \frac{8}{9} - \left(\frac{8}{9}\right)^2 = 8 - \frac{64}{81} = \frac{648}{81} - \frac{64}{81} = \underline{\underline{\frac{584}{81}}}$ ½ $7\frac{17}{81}$

(4)

e.) $\left|8 \cdot \frac{8}{9} - 9\right|^2 = \left(\frac{64}{9} - \frac{81}{9}\right)^2 = \left(-\frac{17}{9}\right)^2 = \underline{\underline{+\frac{289}{81}}}$ ½ $3\frac{46}{81}$

f.) $\sqrt{\frac{\frac{8}{9}}{2}} = \sqrt{\frac{4}{9}} = \underline{\underline{\frac{2}{3}}}$ ½

g.) $\frac{2}{\frac{8}{9} + 3} = \frac{2}{\frac{8}{9} + \frac{27}{9}} = \frac{2}{\frac{35}{9}} = \frac{2}{1} : \frac{35}{9} = \frac{2}{1} \cdot \frac{9}{35} = \underline{\underline{\frac{18}{35}}}$ ½

h.) $\frac{\left(\frac{8}{9}\right)^2}{\frac{8}{9} - 2} = \frac{\frac{64}{81}}{\frac{8}{9} - \frac{18}{9}} = \frac{64}{81} : \left(-\frac{10}{9}\right) = \frac{\cancel{32}^{16}\cancel{64}^{8}}{\cancel{81}_{9}} \cdot \left(-\frac{\cancel{9}^{1}}{\cancel{10}_{5}}\right) = \underline{\underline{-\frac{32}{45}}}$ ½

2.

a.) $2 \cdot \frac{3}{5} - (-3) \cdot \left(\sqrt{5}\right)^2 = \frac{6}{5} + 3 \cdot 5 = \frac{6}{5} + 15 = \underline{\underline{16,2}}$ ¾ $4\frac{81}{100}$

b.) $\left(\frac{3}{5} \cdot \sqrt{5}\right)^2 = \frac{9}{25} \cdot 5 = \frac{9}{\cancel{25}_{5}} \cdot \frac{\cancel{5}^{1}}{1} = \frac{9}{5} = \underline{\underline{1,8}}$ ¾ $1\frac{9}{10}$

(3)

c.) $(-3) : \frac{3}{5} - \sqrt{20} \cdot \sqrt{5} = \left(-\frac{\cancel{3}^{1}}{1}\right) \cdot \frac{5}{\cancel{3}_{1}} - \sqrt{100} =$

$-5 - 10 = \underline{\underline{-15}}$ ¾

d.) $\left(\frac{\frac{3}{5} \cdot (-3)}{\sqrt{5}}\right)^2 = \frac{\frac{9}{25} \cdot 9}{5} = \frac{81}{25} : \frac{5}{1} = \frac{81}{25} \cdot \frac{1}{5} = \underline{\underline{\frac{81}{125}}}$ ¾

$0,648$

3.

a.) $\frac{7}{37} = \frac{14}{74}$; $\frac{7}{38} = \frac{14}{76}$ $0,189$ $0,184$ ⇒ z.B. $\underline{\underline{\frac{14}{75}}}$ ½

b.) $\frac{5}{8} = 0,625$; $\frac{5}{9} = 0,\overline{5}$ ⇒ z.B. $\underline{\underline{\sqrt{0,3}}}$ ¾

(2)

c.) $\sqrt{298} \approx 17,263$; $\sqrt{299} \approx 17,292$ ⇒ z.B. $17,28 = \frac{1'728}{100} = \underline{\underline{\frac{432}{25}}}$ ¾

4. (2)

$c = \sqrt{a^2 + b^2} = \sqrt{(3\cdot\sqrt{6})^2 + (6\cdot\sqrt{3})^2}$ ½

$= \sqrt{54 + 108} = \sqrt{162}$ ½

$= \sqrt{2\cdot 81} = \sqrt{2}\cdot\sqrt{81} = \underline{\sqrt{2}\cdot 9\ \text{cm}}$ 1

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5. (2)

$a^2 = (\sqrt{30}\ \text{cm})^2 = \underline{30\ \text{cm}^2}$

$b^2 = (2\cdot\sqrt{5}\ \text{cm})^2 = \underline{20\ \text{cm}^2}$

$c^2 = (\sqrt{2}\cdot 5\ \text{cm})^2 = \underline{50\ \text{cm}^2}$ 1

$\Rightarrow \underline{a^2 + b^2 = c^2}$ ✓ ½ $\Rightarrow$ Ja, rechtwinklig. ½

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6. (2)

$\frac{x}{2} - 1 = \frac{2}{3}$ ½ $\quad | \cdot 2$

$x - 2 = \frac{4}{3} \quad | \cdot 3$

$3x - 6 = 4 \quad | + 6$

$3x = 10 \quad | : 3$

$\underline{x = \frac{10}{3}}$ 1 Lösung: $\underline{\frac{10}{3}}$ ½

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15 Pkt