Nafn: _____

Einfaldaðu:

1. $a^{\frac{1}{3}} \cdot a^{\frac{3}{4}} = a^{\frac{1}{3}+\frac{3}{4}} = a^{\frac{4}{4}\cdot\frac{1}{3}+\frac{3}{3}\cdot\frac{3}{4}} = a^{\frac{4+9}{12}} = a^{\frac{13}{12}} = \sqrt[12]{a^{13}}$

samnefnari brotaveldis er $3 \cdot 4 = 12$

2. $\sqrt{8}-\sqrt{18}-\sqrt{2} = \sqrt{2\cdot 2^2}-\sqrt{2\cdot 3^2}-\sqrt{2} = 2\sqrt{2}-3\sqrt{2}-\sqrt{2}$

$8 = 2\cdot 2\cdot 2 = 2\cdot 4 = 2\cdot 2^2$
$18 = 2\cdot 9 = 2\cdot 3^2$

$= \sqrt{2}(2-3-1) = -2\sqrt{2}$

3. $\sqrt{5}\cdot\sqrt[3]{25}:\sqrt[6]{5} = 5^{\frac{1}{2}}\cdot(5^2)^{\frac{1}{3}}\cdot(5)^{-\frac{1}{6}} = 5^{\frac{1}{2}}\cdot 5^{\frac{2}{3}}\cdot 5^{-\frac{1}{6}}$ samnefnari 6

$25 = 5^2$

$= 5^{\frac{3\cdot 1}{3\ 2}}\cdot 5^{\frac{2\cdot 2}{2\cdot 3}}\cdot 5^{-\frac{1}{6}} = 5^{\frac{3+4-1}{6}} = 5^{\frac{6}{6}} = 5^1 = 5$

4. $\sqrt[3]{16}\cdot\sqrt[3]{4}:\sqrt{2} = (2^4)^{\frac{1}{3}}\cdot(2^2)^{\frac{1}{3}}\cdot 2^{-\frac{1}{2}} = 2^{\frac{4}{3}}\cdot 2^{\frac{2}{3}}\cdot 2^{-\frac{1}{2}} =$ samnefnari 6.

$16 = 2\cdot 2\cdot 2\cdot 2 = 2^4$
$4 = 2\cdot 2 = 2^2$

$= 2^{\frac{2\cdot 4}{2\cdot 3}+\frac{2\cdot 2}{2\ 3}-\frac{3\cdot 1}{3\cdot 2}} = 2^{\frac{8+4-3}{6}} = 2^{\frac{9}{6}} = 2^{\frac{3\cdot 3}{2\cdot 3}}$

$= 2^{3/2} = \sqrt[3]{2} = 2\sqrt{2}$

5. $\sqrt[3]{a^2}:\sqrt[6]{a} = (a^2)^{\frac{1}{3}}\cdot(a)^{-\frac{1}{6}} = a^{2/3}\cdot a^{-1/6} = a^{\frac{2\cdot 2}{2\ 3}-\frac{1}{6}}$

$= a^{\frac{4-1}{6}} = a^{3/6} = a^{\frac{3}{2\cdot 3}} = a^{1/2} = \sqrt{a}$

Samnefnari brotaveldis er 6.

6. $\sqrt{a}:\sqrt[6]{a^5}\cdot\sqrt[3]{a^2}= a^{\frac{1}{2}} \cdot a^{-\frac{5}{6}} \cdot a^{\frac{2}{3}} = a^{\frac{3\cdot1}{3\cdot2}-\frac{5}{6}+\frac{2\cdot2}{2\cdot3}} = a^{\left(\frac{3-5+4}{6}\right)} = a$

$= a^{\frac{2}{6}} = a^{\frac{2}{2\cdot3}} = a^{\frac{1}{3}} = \sqrt[3]{a}$

7. $\sqrt{12}+\sqrt{27}-\sqrt{75} = \sqrt{3\cdot2^2}+\sqrt{3\cdot3^2}-\sqrt{3\cdot5^2}$

$2^2 = 2\cdot2 = 4$
$3^2 = 9$
$4^2 = 16$
$5^2 = 25$

$= 2\sqrt{3}+3\sqrt{3}-5\sqrt{3} = \sqrt{3}(2+3-5) = \sqrt{3}\cdot0$

$= 0$

8. $\sqrt[3]{343x^3} = (7^3x^3)^{\frac{1}{3}} = 7^{3\cdot\frac{1}{3}}\cdot x^{3\cdot\frac{1}{3}} = 7x$

$5\cdot5\cdot5 = 125$
$6\cdot6\cdot6 = 216$
$7\cdot7\cdot7 = 343$

9. $\sqrt[3]{24}-\sqrt[3]{375}+\sqrt[3]{3} = (3\cdot8)^{\frac{1}{3}}-(3\cdot5^3)^{\frac{1}{3}}+3^{\frac{1}{3}} = (3\cdot2^3)^{\frac{1}{3}}-5\sqrt[3]{3}+\sqrt[3]{3}$

$2\cdot2\cdot2 = 8$

$= 2\sqrt[3]{3}-5\sqrt[3]{3}+\sqrt[3]{3} = \sqrt[3]{3}(2-5+1)$

$= -2\sqrt[3]{3}$

10. Lengdu brotið þannig að nefnarinn verði heil tala $\frac{4}{3+\sqrt{3}}$

$= \frac{4\cdot(3-\sqrt{3})}{(3+\sqrt{3})(3-\sqrt{3})} = \frac{12-4\sqrt{3}}{9-3\sqrt{3}+3\sqrt{3}-3} = \frac{12-4\sqrt{3}}{6} = \frac{2\cdot6-2\cdot2\sqrt{3}}{2\cdot3}$

$= \frac{2(6-2\sqrt{3})}{2\cdot3}$