12. $$\left[\left(\frac{1}{a^2}+\frac{1}{b^2}\right)\cdot\frac{1}{a^2+2ab+b^2}+\frac{2}{(a+b)^3}\cdot\left(\frac{1}{a}+\frac{1}{b}\right)\right]:\frac{a-b}{a^3b^3}=$$

$$=\left[\frac{b^2+a^2}{a^2b^2}\cdot\frac{1}{(a+b)^2}+\frac{2}{(a+b)^3}\cdot\frac{b+a}{ab}\right]\cdot\frac{a^3b^3}{a-b}=$$

$$=\left[\frac{a^2+b^2}{a^2b^2(a+b)^2}+\frac{2\cancel{(a+b)}}{(a+b)^{\cancel{3}2}\cdot ab}\right]\cdot\frac{a^3b^3}{a-b}=$$

$$=\frac{a^2+b^2+2ab}{a^2b^2(a+b)^2}\cdot\frac{a^3b^3}{a-b}=$$

$$=\frac{\cancel{(a+b)^2}}{\cancel{a^2b^2}\cancel{(a+b)^2}}\cdot\frac{\cancel{a^3b^3}}{a-b}=\frac{ab}{a-b}$$

$a\neq 0$
$b\neq 0$
$a\neq\pm b$

13. $$\frac{\left(\frac{x}{y}+\frac{y}{x}-1\right)\left(\frac{x}{y}+\frac{y}{x}+1\right)\left(x^2-y^2\right)}{\frac{x^4}{y^2}-\frac{y^4}{x^2}}=$$

$$=\frac{\frac{x^2+y^2-xy}{xy}\cdot\frac{x^2+y^2+xy}{xy}\cdot(x^2-y^2)\cancel{(x+y)}}{\frac{x^6-y^6}{x^2y^2}}=$$

$$=\frac{(x^2+y^2-xy)\cdot(x^2+y^2+xy)\cdot\cancel{(x^2-y^2)}}{\cancel{x^2y^2}}\cdot\frac{\cancel{x^2y^2}}{\cancel{(x^2-y^2)}(x^4+x^2y^2+y^4)}=$$

$$=\frac{x^4+\cancel{x^2y^2}+\cancel{x^3y}+x^2y^2+y^4+\cancel{xy^3}-\cancel{x^3y}-\cancel{xy^3}-\cancel{x^2y^2}}{x^4+x^2y^2+y^4}=1$$

$x\neq 0$
$y\neq 0$
$x\neq\pm y$