1. Uspořádej vzestupně podle velikosti čísla: $2^2, (-2)^3, -(-2)^2, -(-2)^3, -(-2^4)$

$2^2 = 4$

$(-2)^3 = -8$

$-(-2)^2 = -4$

$-(-2)^3 = -(-8) = 8$

$-(-2^4) = -(-16) = 16$

$\Rightarrow (-2)^3, -(-2)^2, 2^2, -(-2)^3, -(-2^4)$

2. a) $(-2)^3 \cdot (-1)^3 \cdot (-4)^2 = (-8) \cdot (-1) \cdot 16 = 128$

b) $-(-3)^2 \cdot (-1)^3 \cdot (-2)^3 \cdot (-4) = (-9) \cdot (-1) \cdot (-8) \cdot (-4) = 288$

3. a) $2a^3 - 3(-a)^5 + (-a)^3 + 2(-a)^5 - a^5 = 2a^3 - 3(-a^5) - a^3 + 2(-a^5) - a^5 = 2a^3 + 3a^5 - a^3 - 2a^5 - a^5 = a^3$

b) $(-b)^7 + 2(-b)^8 - 3(-b)^7 + (-b)^9 - b^8 - 2b^7 + b^9 = -b^7 + 2b^8 - 3(-b^7) + (-b^9) - b^8 - 2b^7 + b^9 =$
$b^8 + 3b^7 - 3b^7 - b^9 + b^9 = b^8$

c) $(-x)^2 (-x)^4 + x^9 : x^3 + 3(x^2)^3 - 5(-x)^6 = x^2 \cdot x^4 + x^6 + 3x^6 - 5x^6 = x^6 - x^6 = 0$

4. Vyjádři pomocí mocnin prvočísel

a) $\dfrac{(-2)^4 (-2)^5}{(-2^2)^3 \cdot (-2^2)} = \dfrac{2^4 \cdot (-2^5)}{-(2^2)^3 \cdot (-2^2)} = \dfrac{-2^9}{-2^6 \cdot (-2^2)} = \dfrac{-2^9}{2^8} = -2$

b) $\dfrac{(2^4 \cdot 3^2)^3}{(2^3 \cdot 3)^5} \cdot \dfrac{(-2^2)^3}{8} = \dfrac{2^{12} \cdot 3^6}{2^{15} \cdot 3^5} \cdot \dfrac{-2^6}{2^3} = -\dfrac{2^{12} \cdot 3^6}{2^{15} \cdot 3^5} \cdot \dfrac{2^6}{2^3} = -3$

c) $\left(\dfrac{2^2}{5}\right)^5 \left(-\dfrac{5^2}{2^3}\right)^3 = \dfrac{2^{10}}{5^5} \cdot \left(-\dfrac{5^6}{2^9}\right) = -2 \cdot 5$

d) $\dfrac{(2^2 - |-5|)^{19}}{(-2)^3 (-5)^2} = \dfrac{(4-5)^{19}}{-2^3 \cdot 5^2} = -\dfrac{(-1)^{19}}{2^3 \cdot 5^2} = -\dfrac{-1}{2^3 \cdot 5^2} = 2^{-3} \cdot 5^{-2}$

5. Spočti a urči podmínky, za kterých mají výrazy smysl:

a) $\dfrac{(x+y)^3 (x+y)^4}{(x+y)^5} : (x+y)^2 = \dfrac{(x+y)^7}{(x+y)^5} : (x+y)^2 = 1$

$x \neq y$

b) $\dfrac{a^3 b^3 a^4 b^5}{ab^4 a^4 b^2} \cdot \dfrac{1}{a^2 b^2} = \dfrac{a^7 b^8}{a^5 b^6} \cdot \dfrac{1}{a^2 b^2} = 1$

$a \neq 0; b \neq 0$

c) $\dfrac{3a^2 b^3}{4c^5} \cdot \dfrac{2c^3 b^2}{9a^4} \cdot \dfrac{6a^3 c^3}{b^4} = \dfrac{3 \cdot 2 \cdot 6}{4 \cdot 9} \cdot \dfrac{a^5 b^5 c^6}{a^4 b^4 c^5} = abc$

$a \neq 0; b \neq 0; c \neq 0$

d) $\dfrac{x^2 y^3 z^4}{m^5} \cdot \dfrac{m^4 z}{2x^3 y^2} : \dfrac{z^4}{4m^2 x} = \dfrac{yz^5}{2mx} \cdot \dfrac{4m^2 x}{z^4} = 2myz$

$m \neq 0; x \neq 0; y \neq 0; z \neq 0;$

e) $\dfrac{(-v)^3 (-v)^5}{v^2} \cdot \dfrac{v^5}{(-v)^2} = \dfrac{-v^3 \cdot (-v^5) \cdot v^5}{v^2 \cdot v^2} = v^9$

$v \neq 0$

f) $\dfrac{m^3\left(-m\right)^4}{m\left(-m\right)^5}:\dfrac{\left(-m\right)^5}{m^2\left(-m\right)^3}=\dfrac{m^3\cdot m^4}{m\cdot\left(-m^5\right)}:\dfrac{-m^5}{m^2\cdot\left(-m^3\right)}=\dfrac{m^7}{-m^6}:1=-m$

$m\neq 0$

g) $\left(x-y\right)^3\left(y-x\right)^4=\left(x-y\right)^3\left[-\left(x-y\right)\right]^4=\left(x-y\right)^3\left(x-y\right)^4=\left(x-y\right)^7$

h) $\dfrac{\left(r-s\right)^2\left(s-r\right)^2}{r^2s^2}\cdot\dfrac{r^6s^3}{r-s}=\dfrac{\left(r-s\right)^2\left(-\left[r-s\right]\right)^2 r^6s^3}{r^2s^2\left(r-s\right)}=\left(r-s\right)\left(r-s\right)^2 r^4s=\left(r-s\right)^3 r^4s$

$r\neq 0; s\neq 0; r\neq s;$

6. Spočti a urči podmínky, za kterých mají výrazy smysl

a) $\dfrac{a^6\left(a^3\right)^2}{\left(a^3\right)^4}=\dfrac{a^6\cdot a^6}{a^{12}}=1$

$a\neq 0$

b) $\left(\dfrac{-2c}{d}\right)^2\left(\dfrac{-2d}{c}\right)^3\left(\dfrac{c}{2}\right)^4=\dfrac{\left(-2\right)^2 c^2}{d^2}\cdot\dfrac{\left(-2\right)^3 d^3}{c^3}\cdot\dfrac{c^4}{2^4}=2^2\cdot\dfrac{-2^3 d}{c}\cdot\dfrac{c^4}{2^4}=-2c^3d$

$c\neq 0; d\neq 0$

c) $\left[16a^4\left(\dfrac{1}{a^2}\right)^3\left(\dfrac{a}{2}\right)^4\right]^3=\left[2^4 a^4\dfrac{1}{a^6}\dfrac{a^4}{2^4}\right]^3=\left[a^2\right]^3=a^6$

$a\neq 0$

d) $\left(\dfrac{a^2x^3}{a^3x^2}\right)^4\left(\dfrac{a}{x}\right)^5=\left(\dfrac{x}{a}\right)^4\left(\dfrac{a}{x}\right)^5=\dfrac{x^4a^5}{a^4x^5}=\dfrac{a}{x}$

$a\neq 0; x\neq 0;$

e) $\dfrac{\left[3\left(z^2\right)^3 y^2\right]^2}{\left(3zy\right)^4}=\dfrac{\left[3z^6y^2\right]^2}{3^4 z^4 y^4}=\dfrac{3^2 z^{12} y^4}{3^4 z^4 y^4}=\dfrac{z^8}{3^2}$

$z\neq 0; y\neq 0$

f) $\dfrac{2^5\left(2b^3x^3\right)^2}{2\left(2bx^2\right)^3}=\dfrac{2^5 2^2 b^6 x^6}{2\cdot 2^3 b^3 x^6}=2^3 b^3=\left(2b\right)^3$

$b\neq 0; x\neq 0$

g) $\dfrac{\left(2p^2q^3\right)^4\left(3q^2r\right)^3\left(25r^2p^3\right)^2}{\left(6p^3r\right)^3\left(2\cdot 5pq^4\right)^4}=\dfrac{2^4 p^8 q^{12}\cdot 3^3 q^6 r^3\cdot 5^4 r^4 p^6}{2^3\cdot 3^3 p^9 r^3\cdot 2^4\cdot 5^4 p^4 q^{16}}=\dfrac{pq^2 r^4}{2^3}=\dfrac{pq^2 r^4}{8}$

$p\neq 0; q\neq 0; r\neq 0;$

$\dfrac{\left(2u^3v^2\right)^4}{12}:\dfrac{\left(2u^2v^5\cdot 3u^4v^2\right)^2}{\left(3u^2v^4\right)^3}=\dfrac{2^4 u^{12} v^8}{2^2\cdot 3}:\dfrac{2^2 u^4 v^{10}\cdot 3^2 u^8 v^4}{3^3 u^6 v^{12}}=\dfrac{2^2 u^{12} v^8}{3}:\dfrac{2^2 u^6 v^2}{3}=$

h) $\dfrac{2^2 u^{12} v^8}{3}\cdot\dfrac{3}{2^2 u^6 v^2}=u^6 v^6=\left(uv\right)^6$

$u\neq 0; v\neq 0$

7. Vyjádři pomocí mocnin prvočísel

$$\frac{125^2 \cdot 2^{10}}{16^2 \cdot 50} \cdot \frac{25}{5^3} = \frac{\left(5^3\right)^2 \cdot 2^{10}}{\left(2^4\right)^2 \cdot 2 \cdot 5^2} \cdot \frac{5^2}{5^3} = \frac{5^6 \cdot 2^{10} \cdot 5^2}{2^8 \cdot 2 \cdot 5^5} = 2 \cdot 5^3$$

a) $125 = 5 \cdot 25 = 5^3$

$\quad 50 = 2 \cdot 25 = 2 \cdot 5^2$

$$\left(\frac{128 \cdot 3^5}{81 \cdot 8}\right)^3 \cdot \frac{9^4}{\left(16 \cdot 3^5\right)^2} = \left(\frac{2^7 \cdot 3^5}{3^4 \cdot 2^3}\right)^3 \cdot \frac{\left(3^2\right)^4}{\left(2^4 \cdot 3^5\right)^2} = \left(2^4 \cdot 3\right)^3 \cdot \frac{3^8}{2^8 \cdot 3^{10}} = \frac{2^{12} \cdot 3^3 \cdot 3^8}{2^8 \cdot 3^{10}} = 2^4 \cdot 3$$

b) $128 = 4 \cdot 32 = 2^2 \cdot 4 \cdot 8 = 2^7$

$\quad 81 = 3 \cdot 27 = 3^4$

$$\frac{\left(72 \cdot 25\right)^3 \cdot 2^4}{5 \cdot 15^4 \cdot 32^2} \cdot \left(\frac{5^2 \cdot 27^2 \cdot 8^3}{\left[12 \cdot 5\right]^3 \cdot 9}\right)^2 = \frac{\left(2^3 \cdot 3^2 \cdot 5^2\right)^3 \cdot 2^4}{5 \cdot \left(3 \cdot 5\right)^4 \cdot \left(2^5\right)^2} \cdot \left(\frac{5^2 \cdot \left(3^3\right)^2 \cdot \left(2^3\right)^3}{\left[3 \cdot 2^2 \cdot 5\right]^3 \cdot 3^2}\right)^2 =$$

c) $\dfrac{2^9 \cdot 3^6 \cdot 5^6 \cdot 2^4}{5 \cdot 3^4 \cdot 5^4 \cdot 2^{10}} \cdot \left(\dfrac{5^2 \cdot 3^6 \cdot 2^9}{3^3 \cdot 2^6 \cdot 5^3 \cdot 3^2}\right)^2 = 3^2 \cdot 2^3 \cdot 5 \cdot \left(\dfrac{3 \cdot 2^3}{5}\right)^2 = 3^2 \cdot 2^3 \cdot 5 \cdot \dfrac{3^2 \cdot 2^6}{5^2} = \dfrac{3^4 \cdot 2^9}{5}$

$\quad 72 = 8 \cdot 9 = 2^3 \cdot 3^2$

$\quad 32 = 2^5$

8. Zjednoduš výrazy a urči podmínky:

a) $\dfrac{2\left(ab\right)^3}{3a^2 b} \cdot \dfrac{\left(3a^3 b^2\right)^2}{a^5 b^3} = \dfrac{2a^3 b^3}{3a^2 b} \cdot \dfrac{3^2 a^6 b^4}{a^5 b^3} = 6a^2 b^3$

$\quad a \neq 0; b \neq 0$

b) $\dfrac{5a^3 b^7}{2ab^6} \cdot \left(\dfrac{2a^2 b^3}{ab^2}\right)^3 = \dfrac{5a^3 b^7}{2ab^6} \cdot \dfrac{2^3 a^6 b^9}{a^3 b^6} = 5 \cdot 2^2 a^5 b^4$

$\quad a \neq 0; b \neq 0$

c) $\dfrac{2x^5 y^3}{\left(2x^2 y\right)^2} : \left(\dfrac{xy}{2xy^2}\right)^3 = \dfrac{2x^5 y^3}{2^2 x^4 y^2} : \left(\dfrac{1}{2y}\right)^3 = \dfrac{xy}{2} : \dfrac{1}{2^3 y^3} = \dfrac{xy}{2} \cdot 2^3 y^3 = 2^2 xy^4$

$\quad x \neq 0; y \neq 0$

d) $\dfrac{7x^4 y^7}{8x^3 y} : \dfrac{\left(x^2 y\right)^4}{\left(2x^3 y^2\right)^3} = \dfrac{7xy^6}{8} : \dfrac{x^8 y^4}{2^3 x^9 y^6} = \dfrac{7xy^6}{2^3} : \dfrac{1}{2^3 xy^2} = \dfrac{7xy^6}{2^3} \cdot 2^3 xy^2 = 7x^2 y^8$

$\quad x \neq 0; y \neq 0$

e) $\dfrac{a-b}{\left(a+b\right)^{-1}} = \dfrac{a-b}{\dfrac{1}{a+b}} = \left(a-b\right)\left(a+b\right) = a^2 - b^2$

$\quad a \neq -b$

f) $\left(\dfrac{a^{-3} b^2}{c^{-3} d}\right)^{-2} = \dfrac{a^6 b^{-4}}{c^6 d^{-2}} = \dfrac{a^6 d^2}{c^6 b^4}$

$\quad a \neq 0; b \neq 0; c \neq 0; d \neq 0;$

g) $\left(\dfrac{3x^{-2} y^{-3}}{5z^{-4}}\right)^{-5} = \dfrac{3^{-5} x^{10} y^{15}}{5^{-5} z^{20}} = \dfrac{5^5 x^{10} y^{15}}{3^5 z^{20}} = \dfrac{5^5}{3^5} \dfrac{x^{10}}{z^{20}} y^{15} = \left(\dfrac{5}{3}\right)^5 \left(\dfrac{x}{z^2}\right)^{10} y^{15}$

$\quad x \neq 0; y \neq 0; z \neq 0;$

h) $\left(\dfrac{x^0 z^{-3}}{y^{-3}}\right)^{-4} = \left(\dfrac{z^{-3}}{y^{-3}}\right)^{-4} = \dfrac{z^{12}}{y^{12}} = \left(\dfrac{z}{y}\right)^{12}$

$x \neq 0;\ y \neq 0;\ z \neq 0;$

$\left(\dfrac{a^2 b^{-4}}{c^{-3} d^{-2}}\right)^{-3} : \left(\dfrac{a^3 b^{-3}}{c^{-2} d^{-2}}\right)^{-2} = \dfrac{a^{-6} b^{12}}{c^9 d^6} \cdot \left(\dfrac{a^3 b^{-3}}{c^{-2} d^{-2}}\right)^2 = \dfrac{b^{12}}{a^6 c^9 d^6} \cdot \left(\dfrac{a^3 b^{-3}}{c^{-2} d^{-2}}\right)^2 =$

i) $\dfrac{b^{12}}{a^6 c^9 d^6} \cdot \dfrac{a^6 b^{-6}}{c^{-4} d^{-4}} = \dfrac{b^{12}}{a^6 c^9 d^6} \cdot \dfrac{a^6 c^4 d^4}{b^6} = \dfrac{b^6}{c^5 d^2}$

$a \neq 0;\ b \neq 0;\ c \neq 0;\ d \neq 0;$

j) $\left[\dfrac{1}{(x+y)^{-3}}\right]^{-2} \cdot (x+y)^{-3} = \dfrac{1}{(x+y)^6} \cdot (x+y)^{-3} = \dfrac{1}{(x+y)^9}$

$x \neq -y$

$\left(\dfrac{a^{-3} b^{-7} c^0}{a^{-5} b^{-11} c^{13}}\right)^{-4} \left(\dfrac{a^2 b^{-3} c^{-4}}{a^4 b^7 c^0}\right)^{-2} = \left(a^{-3-(-5)} b^{-7-(-11)} c^{0-13}\right)^{-4} \left(a^{2-4} b^{-3-7} c^{-4-0}\right)^{-2} = \left(a^2 b^4 c^{-13}\right)^{-4} \left(a^{-2} b^{-10} c^{-4}\right)^{-2} =$

k) $a^{-8} b^{-16} c^{52} \cdot a^4 b^{20} c^8 = a^{-4} b^4 c^{60} = \dfrac{b^4 c^{60}}{a^4}$

$a \neq 0;\ b \neq 0;\ c \neq 0;$

$\left(a + \dfrac{1}{b}\right)^{-2} \left(b - \dfrac{1}{a}\right)^{-3} \left(ab - \dfrac{1}{ab}\right)^2 = \left(\dfrac{ab}{b} + \dfrac{1}{b}\right)^{-2} \left(\dfrac{ab}{a} - \dfrac{1}{a}\right)^{-3} \left(\dfrac{a^2 b^2}{ab} - \dfrac{1}{ab}\right)^2 =$

l) $\left(\dfrac{ab+1}{b}\right)^{-2} \left(\dfrac{ab-1}{a}\right)^{-3} \left(\dfrac{a^2 b^2 - 1}{ab}\right)^2 = \left(\dfrac{b}{ab+1}\right)^2 \left(\dfrac{a}{ab-1}\right)^3 \left(\dfrac{(ab+1)(ab-1)}{ab}\right)^2 =$

$\dfrac{b^2}{(ab+1)^2} \dfrac{a^3}{(ab-1)^3} \dfrac{(ab+1)^2 (ab-1)^2}{a^2 b^2} = \dfrac{a}{ab-1}$

$a \neq \pm\dfrac{1}{b},\ a \neq 0,\ b \neq 0$

9. Vypočti:

$2^{-3} - 4^{-2} - 5^{-2} + 20^{-2} = \dfrac{1}{2^3} - \dfrac{1}{4^2} - \dfrac{1}{5^2} + \dfrac{1}{20^2} =$

a) $\dfrac{1}{8} - \dfrac{1}{16} - \dfrac{1}{25} + \dfrac{1}{400} = \dfrac{50 - 25 - 16 + 1}{400} = \dfrac{10}{400} = \dfrac{1}{40}$

b) $\left(\sqrt{5} - 2\right)^{-1} = \dfrac{1}{\sqrt{5} - 2} = \dfrac{1}{\sqrt{5} - 2} \cdot \dfrac{\sqrt{5} + 2}{\sqrt{5} + 2} = \dfrac{\sqrt{5} + 2}{5 - 4} = \sqrt{5} + 2$

$40\left(5 - \sqrt{5}\right)^{-2} = \dfrac{40}{\left(5 - \sqrt{5}\right)^2} = \dfrac{40}{25 - 2 \cdot 5\sqrt{5} + 5} = \dfrac{40}{30 - 10\sqrt{5}} = \dfrac{40}{10\left(3 - \sqrt{5}\right)} =$

c) $\dfrac{4}{\left(3 - \sqrt{5}\right)} = \dfrac{4}{\left(3 - \sqrt{5}\right)} \cdot \dfrac{3 + \sqrt{5}}{3 + \sqrt{5}} = \dfrac{4\left(3 + \sqrt{5}\right)}{9 - 5} = \dfrac{4\left(3 + \sqrt{5}\right)}{4} = 3 + \sqrt{5}$

d) $\left(\dfrac{1}{2}\right)^{-3} - \left(\dfrac{1}{4}\right)^{-2} - \left(\dfrac{1}{5}\right)^{-2} + \left(\dfrac{1}{20}\right)^{-2} = 2^3 - 4^2 - 5^2 + 20^2 = 8 - 16 - 25 + 400 = 367$

$\left(\sqrt{3}\right)^{-2} - \left(-\sqrt{3}\right)^{-2} - \left(\dfrac{1}{\sqrt{3}}\right)^3 - \left(-\dfrac{1}{\sqrt{3}}\right)^3 = \dfrac{1}{\left(\sqrt{3}\right)^2} - \dfrac{1}{\left(-\sqrt{3}\right)^2} - \dfrac{1}{\left(\sqrt{3}\right)^3} - \dfrac{1}{-\left(\sqrt{3}\right)^3} =$

e)

$\dfrac{1}{3} - \dfrac{1}{3} - \dfrac{1}{\left(\sqrt{3}\right)^3} + \dfrac{1}{\left(\sqrt{3}\right)^3} = 0$

10. Spočti (využij převedení čísla na exponenciální tvar)

a) $\dfrac{105000}{0{,}021} = \dfrac{105 \cdot 10^3}{21 \cdot 10^{-3}} = 5 \cdot 10^6$

b) $\dfrac{0{,}252}{70000} \cdot \dfrac{200}{0{,}9} = \dfrac{252 \cdot 10^{-3} \cdot 2 \cdot 10^2}{7 \cdot 10^4 \cdot 9 \cdot 10^{-1}} = \dfrac{28 \cdot 2 \cdot 10^{-1}}{7 \cdot 10^3} = 8 \cdot 10^{-4}$

c) $\dfrac{0{,}000575}{2300000} : \dfrac{0{,}005}{100000} = \dfrac{575 \cdot 10^{-6}}{23 \cdot 10^5} : \dfrac{5 \cdot 10^{-3}}{10^5} = \dfrac{575 \cdot 10^{-6}}{23 \cdot 10^5} \cdot \dfrac{10^5}{5 \cdot 10^{-3}} = \dfrac{115}{23} \cdot 10^{-3} = 5 \cdot 10^{-3}$

d) $800000 \cdot 0{,}025 = 8 \cdot 10^5 \cdot 25 \cdot 10^{-3} = 200 \cdot 10^2 = 2 \cdot 10^4$

11. Zjednoduš výrazy (uveď podmínky)

a) $\dfrac{2^n \cdot 2^{n+1} \cdot 2^{n+2}}{2^3 \cdot 2^2} = \dfrac{2^{n+n+1+n+2}}{2^5} = \dfrac{2^{3n+3}}{2^5} = 2^{3n-2}$

b) $\dfrac{(-3)^{2n} \cdot (-3)^{2n+1} \cdot (-2)^{2n-1}}{-3} = \dfrac{3^{2n} \cdot -3^{2n+1} \cdot \left(-2^{2n-1}\right)}{-3} = -\dfrac{3^{4n+1} \cdot 2^{2n-1}}{3} = -3^{4n} \cdot 2^{2n-1}$

c) $\dfrac{a^n \cdot b^n \cdot a^n \cdot b^n}{ab} = \dfrac{a^n \cdot a^n \cdot b^n \cdot b^n}{ab} = \dfrac{a^{2n} \cdot b^{2n}}{ab} = \dfrac{(ab)^{2n}}{ab} = (ab)^{2n-1} = a^{2n-1} \cdot b^{2n-1}$

$a \neq 0; b \neq 0$

d) $(-a)^{2n+3} : a^{2n} = -a^{2n+3} : a^{2n} = -a^{2n+3-2n} = -a^3$

$a \neq 0$

$(a-b-c)^{2n} (b+c-a)^{2n+1} (b+c-a) = \left[-(b+c-a)\right]^{2n} (b+c-a)^{2n+2} =$

e) $(b+c-a)^{2n} (b+c-a)^{2n+2} = (b+c-a)^{4n+2}$

$a-b-c \neq 0 \ (\text{pro } n < 0)$

f) $\left(\dfrac{a^2}{b^3}\right)^k \left(\dfrac{c^2}{d^3}\right)^k \left(\dfrac{b^2 d^3}{ac^2}\right)^k = \dfrac{a^{2k}}{b^{3k}} \dfrac{c^{2k}}{d^{3k}} \dfrac{b^{2k} d^{3k}}{a^k c^{2k}} = \dfrac{a^k}{b^k} = \left(\dfrac{a}{b}\right)^k$

$a \neq 0; b \neq 0; c \neq 0; d \neq 0;$

$\left[\dfrac{(x-5)^2}{x-2}\right]^k \left[\dfrac{x^2-4}{x-5}\right]^k = \dfrac{(x-5)^{2k}}{(x-2)^k} \dfrac{\left(x^2-4\right)^k}{(x-5)^k} = (x-5)^k \dfrac{\left[(x-2)(x+2)\right]^k}{(x-2)^k} =$

g) $(x-5)^k \dfrac{(x-2)^k (x+2)^k}{(x-2)^k} = (x-5)^k (x+2)^k$

$x \neq 2; x \neq 5; x-2 \ (\text{pro } k < 0)$

h) $\dfrac{\left(1-\frac{a-b}{a}\right)^k}{\left(1+\frac{a-b}{b}\right)^k} = \dfrac{\left(\frac{a-(a-b)}{a}\right)^k}{\left(\frac{b+(a-b)}{b}\right)^k} = \dfrac{\left(\frac{b}{a}\right)^k}{\left(\frac{a}{b}\right)^k} = \dfrac{\frac{b^k}{a^k}}{\frac{a^k}{b^k}} = \dfrac{b^{2k}}{a^{2k}} = \left(\dfrac{b}{a}\right)^{2k}$

$a \neq 0; b \neq 0$

i) $\dfrac{x^{2k}-2x^{k}+1}{x^{3}} : \dfrac{x^{2}}{\left(x^{k}-1\right)^{3}} = \dfrac{\left(x^{k}-1\right)^{2}}{x^{3}} \cdot \dfrac{\left(x^{k}-1\right)^{3}}{x^{2}} = \dfrac{\left(x^{k}-1\right)^{5}}{x^{5}}$

$x \neq 0; x^{k} \neq 1$

$\dfrac{\left(a-b\right)^{x+y+1}\left(a+b\right)^{x+y+1}}{\left(a^{2}-b^{2}\right)^{x+y}} = \dfrac{\left(a-b\right)^{x+y+1}\left(a+b\right)^{x+y+1}}{\left[\left(a-b\right)\left(a+b\right)\right]^{x+y}} = \dfrac{\left(a-b\right)^{x+y+1}\left(a+b\right)^{x+y+1}}{\left(a-b\right)^{x+y}\left(a+b\right)^{x+y}} =$

j) $\left(a-b\right)\left(a+b\right) = a^{2}-b^{2}$

$a \neq \pm b$