2. a) $\frac{x+y}{2}+\frac{x-y}{2}$ b) $\frac{x-y}{2}-\frac{x+y}{2}$ c) $\frac{x+y}{2}-\frac{x-y}{2}$

d) $\frac{a+b-c}{2}+\frac{a-b-c}{2}$ e) $\frac{r-s+t}{3}-\frac{r+s-t}{3}+\frac{t-r-s}{3}$

f) $\frac{18a-13b}{a+b}-\frac{25a+9b}{a+b}+\frac{10a+25b}{a+b}$

g) $\frac{5p^2+pq+2q^2}{p+q}-\frac{6p^2+2pq}{p+q}+\frac{4p^2+3pq}{p+q}-\frac{2p^2+q^2}{p+q}$

h) $\frac{9x-16}{x^2-1}-\frac{2x^2-6x-7}{x^2-1}+\frac{7x^2-5x+14}{x^2-1}$

i) $\frac{a-2b}{2a-b}-\frac{5a-4b}{2a-b}$ k) $\frac{q}{p^2-q^2}-\frac{p}{p^2-q^2}$

3. a) $\frac{(m+n)^2}{2}+\frac{(m-n)^2}{2}$ b) $\frac{(2x-y)^2}{4y}-\frac{(2x+y)^2}{4y}$

c) $\frac{(3a-2b)^2}{2ab}-\frac{(5a+3b)^2}{2ab}-\frac{(5b-4a)(4a-b)}{2ab}$

4. a) $\frac{7}{12}-\frac{5}{8}+\frac{5}{6}-\frac{3}{16}$ b) $\frac{13}{24}-\frac{5}{18}+\frac{3}{8}-\frac{29}{36}$ c) $13\frac{13}{18}-5\frac{3}{16}-6\frac{5}{12}$

d) $\frac{a}{2}-\frac{a}{3}$ e) $\frac{x}{15}-\frac{x}{6}-\frac{x}{30}+\frac{x}{10}$ f) $\frac{2a}{3}-\frac{a}{4}-\frac{3a}{5}-\frac{5a}{6}$

g) $\frac{p}{2}-\frac{q}{3}$ h) $\frac{3a}{7}+\frac{2b}{3}-\frac{9a}{14}$ i) $\frac{5x}{22}-\frac{16y}{33}+\frac{5x}{6}-\frac{9y}{11}$

k) $\frac{a+b}{2}+\frac{a-b}{3}$ l) $\frac{a-b}{12}-\frac{a+b}{18}$ m) $\frac{a+b}{21}-\frac{a-b}{9}$

n) $\frac{11p-5q}{12}-\frac{3p-5q}{6}+\frac{5p-7q}{4}$ o) $\frac{5a+3b}{21}-\frac{2b-a}{5}-\frac{13a+12b}{35}$

p) $1-\frac{3}{7}$ q) $a-\frac{2a}{5}$ r) $\frac{x}{4}+4x$ s) $2-\frac{m}{3}$

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5. a) $\frac{a}{b}+\frac{c}{d}$ b) $\frac{1}{x}-\frac{1}{y}$ c) $\frac{x}{ab}+\frac{y}{ac}$ d) $\frac{3}{a}-\frac{5}{a^2}$

e) $\frac{3}{4a}+\frac{1}{7a}$ f) $\frac{7}{9c}-\frac{7}{12c}+\frac{7}{8}$ g) $\frac{19x}{15y}+\frac{z}{5y}-\frac{16x}{25y}+\frac{7z}{10y}$

h) $\frac{2}{5a}+\frac{4}{5b}$ i) $\frac{5q}{9p}-\frac{7p}{12q}$ k) $\frac{5yz}{3x}+\frac{3xz}{4y}-\frac{7xy}{2z}$

l) $\frac{1}{2u^2}-\frac{2}{5v^2}-\frac{3}{4w^2}$ m) $\frac{4x}{15az}-\frac{3y}{25ax}-\frac{8z}{75ay}$

n) $\frac{a}{2x^4}+\frac{b}{4x^2}-\frac{c}{x}+\frac{d}{7}$ o) $\frac{2c}{3ab^2}-\frac{5}{9abc}+\frac{3b}{8ac^2}-\frac{7a}{12b^2c}$

p) $\frac{a}{b}+1$ q) $\frac{a}{b}-a$ r) $y-\frac{x}{y}$ s) $x+\frac{2}{x^2}$

6. a) $\frac{x-y}{a}-\frac{u+v}{b}$ b) $\frac{x+y}{p}+\frac{x-y}{q}$ c) $\frac{a-b}{b}-\frac{a-b}{a}$

d) $\frac{2p+3q}{4p}-\frac{3p-7q}{5q}$ e) $\frac{4a+3b}{5bc}+\frac{2b-7c}{3ab}-\frac{9a+10}{15ac}$

f) $\frac{a-10b}{10a^2}-\frac{6a-5b}{6ab}+\frac{2b^2+5ab-3a^2}{5ab^2}+\frac{3a}{5b^2}$

g) $\frac{a^2+b^2}{2ab}-1$ h) $4+\frac{(x-y)^2}{xy}$ i) $\frac{p^2-q^2}{2q}+(p+q)$

k) $2+\frac{x^2+y^2-z^2}{xy}$ l) $\frac{a^2-b^2-c^2}{2bc}+1$ m) $2+\frac{p^2-pq+q^2}{pq}$

7. a) $\frac{1}{x+y}+\frac{1}{x-y}$ b) $\frac{a}{a-b}-\frac{b}{a+b}$ c) $\frac{p+q}{p-q}-\frac{p-q}{p+q}$

d) $\frac{9a}{x+y}-\frac{5a}{x-y}$ e) $\frac{4r-3s}{5r-s}+\frac{5r+s}{4r+3}$ f) $\frac{8x-9y}{3x+5y}-\frac{2x-9y}{x+5y}$

g) $\frac{2c}{u-v}-\frac{3c}{4u}$ h) $\frac{s}{s-t}+\frac{t}{s+t}-\frac{2t}{s}$ i) $\frac{x}{y}-\frac{y}{x}+\frac{x+y}{x-y}$

k) $\frac{y}{ax-ay}+\frac{x}{ax+ay}$ l) $\frac{8x-3}{4x+4}-\frac{6x+4}{3x-3}$ m) $\frac{4xy}{x^2-y^2}+\frac{x-y}{x+y}$

n) $\frac{2a}{a^2+2ab+b^2}-\frac{1}{a+b}$ o) $\frac{3p}{(p-q)^2}-\frac{2}{p-q}-\frac{3q}{(q-p)^2}$

p) $\frac{1}{x+1}-\frac{2}{x+2}+\frac{1}{x+3}$ q) $\frac{6x}{x-1}-\frac{7x}{2x-2}-\frac{5x}{3x-3}$

r) $\frac{2v}{u-v}+1$ s) $\frac{4pq}{(p-q)^2}+1$ t) $(x-y)-\frac{x-y}{x+y}$

8. a) $\frac{2x-3y}{2x+3y}-\frac{2x+3y}{2x-3y}+\frac{8x^2+18y^2}{4x^2-9y^2}$

b) $\frac{5a-6b}{4a+4b}-\frac{2a-b}{3a-3b}-\frac{a^2-37ab+28b^2}{12a^2-12b^2}$

c) $\frac{3p^2+1{,}5p-3}{18p^2-8}-\frac{2p+3}{15p+10}-\frac{p-1}{12p-8}$ d) $\frac{2r}{rs-s^2}-\frac{2s}{r^2-rs}+\frac{r+s}{2rs}$

e) $\frac{a^2+b^2}{2ab}-\frac{a}{a+b}-\frac{b}{a-b}+\frac{b^4-a^4+4a^3b}{2(a^3b-ab^3)}$ f) $\frac{1}{z-1}+\frac{1}{z+1}-\frac{2}{z^2-1}-1$

g) $\frac{x+y}{y}-\frac{x-y}{x}-\frac{4xy}{x^2+y^2}$ h) $\frac{1}{p^2-p}-\frac{p^2}{p+1}+\frac{1}{p}-\frac{2}{p^2-1}+p-2$

i) $\frac{3a-2b}{a^2-2ab+b^2}-\frac{2a+3b}{a^2-b^2}$ k) $\frac{m-3}{m+4}-\frac{m^2-9m-3}{m^2+m-12}+\frac{m-5}{m-3}$

l) $\frac{7}{3k}-\frac{5}{k-3}+\frac{3}{k+1}+\frac{1}{k+5}$ m) $\frac{a}{a-b}-\frac{b^2}{a^2+ab+b^2}-\frac{a^2b}{a^3-b^3}$

9. a) $\frac{1}{a-b}+\frac{1}{b-a}$ b) $\frac{3x-8y}{2x-5y}-\frac{y}{10y-4x}$ c) $\frac{3y+4}{5y^2-20}+\frac{1}{4-2y}$

10. a) $\frac{5}{a}-\frac{3}{3a}$ b) $\frac{10x}{14a+6b}+\frac{4x}{7a+3b}$ c) $\frac{9x-6y}{12x-9y}-\frac{10x+8y}{8x+6y}$

d) $\frac{4}{x-y}+\frac{6x+6y}{x^2-y^2}$ e) $\frac{3}{6p+15}-\frac{2p-5}{4p^2-20p+25}$

11. a) $\frac{36(u-v)}{3u^2-3v^2}-\frac{36(u-v)}{(3u-3v)^2}$ b) $\frac{(3x-2)^2}{4-9x^2}+\frac{27x^2-12}{27x^2-36x+12}$

c) $\frac{5r+20}{2r^2+8r}-\frac{3r-6}{r^2-4}-\frac{4r-16}{r^2-4r}+\frac{r}{2r^2+4r}$

d) $\frac{x^2+36y^2}{x-6y}-\frac{3x+18y}{x^2-36y^2}+\frac{12xy+6y-x-3}{6y-x}-1$

e) $\frac{a^3-b^3}{a^2-b^2}-\frac{a^3+a^2b+ab^2+b^3}{a^2+2ab+b^2}-a$