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Algebra II

Adding and Subtracting Fractions Rational Expressions

1. What is the sum of $\frac{2}{x}$ and $\frac{x}{2}$?

(1) 1
(3) $\frac{4+x}{2x}$
(2) $\frac{2+x}{2x}$
(4) $\frac{4+x^2}{2x}$

$\frac{2}{2}\left(\frac{2}{x}\right)$ and $\left(\frac{x}{2}\right)\frac{x}{x}$ Fl: x, Fd: 2, LCD: 2x

$\frac{4}{2x} + \frac{x^2}{2x} = \frac{4+x^2}{2x}$

2. Which expression is equivalent to $\frac{2a}{2x}+\frac{b}{2x}$?

(1) $\frac{2a+b}{2x}$
(3) $\frac{a+b}{3x}$
(2) $\frac{2a+b}{x}$
(4) $\frac{a+b}{2x}$

Fl: x, Fd: 2, LCD: 2x

$\frac{2a}{2x} + \frac{b}{2x} = \frac{2a+b}{2x}$

3. The sum of $\frac{3}{x}+\frac{2}{5}$, $x \neq 0$, is

$\frac{5}{5}\frac{3}{x}$ and $\frac{2}{5}\frac{(x)}{(x)}$ Fl: x, Fd: 5, LCD: 5x

(1) $\frac{1}{x}$
(3) $\frac{5}{x+5}$
(2) $\frac{2x+15}{5x}$
(4) $\frac{2x+15}{x+5}$

$\frac{15}{5x} + \frac{2x}{5x}$ $\frac{15+2x}{5x}$

4. What is the sum of $\frac{3}{7n}$ and $\frac{7}{3n}$?

(1) $\frac{1}{n}$
(3) $\frac{42}{21n}$
(2) $\frac{10}{21n}$
(4) $\frac{58}{21n}$

$\frac{(3)}{(3)}\frac{3}{7n}$ and $\frac{7}{3n}\frac{(7)}{(7)}$ Fl: 21, Fd: n, LCD: 21n

$\frac{9}{21n} + \frac{49}{21n} = \frac{58}{21n}$

5. The expression $\frac{y}{x}-\frac{1}{2}$ is equivalent to

$\frac{(2)}{(2)}\frac{y}{x}$ and $\frac{1}{2}\frac{(x)}{(x)}$ Fl: x, Fd: 2, LCD: 2x

(1) $\frac{2y-x}{2x}$
(3) $\frac{1-y}{2x}$
(2) $\frac{x-2y}{2x}$
(4) $\frac{y-1}{x-2}$

$\frac{2y}{2x} - \frac{x}{2x} = \frac{2y-x}{2x}$

6. Expressed as a single fraction, what is $\frac{1}{x+1}+\frac{1}{x}, x\neq 0,-1$?

(1) $\frac{2x+3}{x^2+x}$ (3) $\frac{2}{2x+1}$

(2) $\frac{2x+1}{x^2+x}$ (4) $\frac{3}{x^2}$

$\frac{(x)}{(x)}\frac{1}{x+1}+\frac{1}{x}\frac{(x+1)}{(x+1)}$ Fl: x F2: $x+1$ LCD: $x(x+1)$

$\frac{x}{x(x+1)}+\frac{x+1}{x(x+1)}=\frac{2x+1}{x(x+1)}$

7. What is the sum of $\frac{-1}{-1}\frac{(3)}{(x-3)}$ and $\frac{x}{3-x}$?

(1) 1 (3) $\frac{x+3}{x-3}$

(2) -1 (4) 0

$-1(x-3)$ Fl: -1 F2: $x-3$ LCD: $-1(x-3)$

$\frac{-3}{-1(x-3)}+\frac{x}{-1(x-3)}=\frac{x-3}{-1(x-3)}=-1$

8. Expressed as a single fraction, what is $\frac{x}{x}\frac{1}{x+1}+\frac{1}{x}\frac{x+1}{x+1}, x\neq 0,-1$?

(1) $\frac{2x+3}{x^2+x}$ (3) $\frac{2}{2x+1}$

(2) $\frac{2x+1}{x^2+x}$ (4) $\frac{3}{x^2}$

Fl: x F2: $x+1$ LCD: $x(x+1)$

$\frac{x}{x(x+1)}+\frac{x+1}{x(x+1)}$

$\frac{2x+1}{x(x+1)}$

9. What is the sum of $\frac{(y+2)}{(y+2)}(y-5)+\frac{3}{y+2}$?

(1) $y-5$ (3) $\frac{y-2}{y+2}$

(2) $\frac{y^2-7}{y+2}$ (4) $\frac{y^2-3y-7}{y+2}$

Fl: $y+2$ LCD: $y+2$

	y	$+2$
y	y^2	$2y$
-5	$-5y$	-10

$y^2-3y-10$

$\frac{(y+2)(y-5)}{y+2}+\frac{3}{y+2}$

$\frac{y^2-3y-10}{y+2}+\frac{3}{y+2}=\frac{y^2-3y-7}{y+2}$

10. Express in simplest form: $\frac{1}{x}+\frac{1}{x+3}\frac{(x)}{(x)}$

$\frac{(x+3)}{(x+3)}$ Fl: x F2: $x+3$ LCD: $x(x+3)$

$\frac{x+3}{x(x+3)}+\frac{x}{x(x+3)}=\frac{2x+3}{x(x+3)}$

11. $\frac{2}{x-4}+\frac{3}{x+4}$

$\frac{(x+4)}{(x+4)}\frac{2}{x-4}+\frac{3}{x+4}\frac{(x-4)}{(x-4)}$ Fl: $x-4$ F2: $x+4$ LCD: $(x-4)(x+4)$

$\frac{2(x+4)}{(x-4)(x+4)}+\frac{3(x-4)}{(x-4)(x+4)}$

$\frac{2(x+4)+3(x-4)}{(x-4)(x+4)}$ $\frac{2x+8+3x-12}{(x-4)(x+4)}$

$\frac{5x-4}{(x-4)(x+4)}$

12. $\frac{c}{c}\frac{9}{c+8}-\frac{2}{c}\frac{(c+8)}{(c+8)}$ Fl: c F2: $c+8$ LCD: $c(c+8)$

$\frac{9c}{c(c+8)}-\frac{2(c+8)}{c(c+8)}$

$\frac{9c-2c-16}{c(c+8)}$

$\frac{7c-16}{c(c+8)}$