

Unit 4A review

Date _____ Period _____

Simplify each expression.

1) $\frac{8x}{x+8} + \frac{8x}{x-3}$

2) $\frac{k-6}{4k-16} + \frac{7}{4k}$

3) $\frac{3}{2r^2+2r} + \frac{r-7}{2r}$

4) $\frac{4a}{a-5} + \frac{3a}{7a+6}$

5) $\frac{8}{3} - \frac{n+8}{4n-8}$

6) $\frac{3n}{4} - \frac{5}{n+8}$

7) $\frac{k-7}{3k+12} - \frac{k+6}{2k}$

8) $\frac{3n}{2n-5} - \frac{3}{5n+2}$

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1) $\frac{8x}{x+8} + \frac{8x}{x-3}$

$$\left(\frac{x-3}{x-3}\right)\left(\frac{8x}{x+8}\right) + \left(\frac{8x}{x-3}\right)\left(\frac{x+8}{x+8}\right)$$

$$= \frac{(8x^2 - 24x) + (8x^2 + 64x)}{(x-3)(x+8)}$$

$$= \frac{16x^2 + 40x}{(x-3)(x+8)}$$

$$(x-3)(x+8) = 0$$

$$x = 3 \quad x = -8$$

$$= \frac{8x(2x+5)}{(x-3)(x+8)}, \text{ undefined @ } x=3 + x=-8$$

2) $\frac{k-6}{4k-16} + \frac{7}{4k}$

$$\left(\frac{k}{k}\right)\left(\frac{k-6}{4(k-4)}\right) + \left(\frac{7}{4k}\right)\left(\frac{k-4}{k-4}\right)$$

$$= \frac{(k^2 - 6k) + (7k - 28)}{4k(k-4)}$$

$$4k(k-4) = 0$$

$$k = 0, k = 4$$

$$= \frac{k^2 + k - 28}{4k(k-4)}, \text{ undefined @ } k=0 + k=4$$

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$$3) \quad \frac{3}{2r^2+2} + \frac{r-7}{2r}$$

$$\frac{3}{2r(r+1)} + \left(\frac{r-7}{2r} \right) \left(\frac{r+1}{r+1} \right)$$

$$= \frac{3 + (r^2 - 6r - 7)}{2r(r+1)}$$

$$2r(r+1) = 0 \\ r = 0 \quad r = -1$$

$$= \frac{r^2 - 6r - 4}{2r(r+1)}, \text{ undefined @ } r = 0 + r = -1$$

$$4) \quad \frac{4a}{a-5} + \frac{3a}{7a+6}$$

$$= \left(\frac{7a+6}{7a+6} \right) \left(\frac{4a}{a-5} \right) + \left(\frac{3a}{7a+6} \right) \left(\frac{a-5}{a-5} \right)$$

$$= \frac{(28a^2 + 24a) + (3a^2 - 15a)}{(7a+6)(a-5)}$$

$$= \frac{31a^2 + 9a}{(7a+6)(a-5)}$$

$$(7a+6)(a-5) = 0 \\ a = -6/7, a = 5$$

$$= \frac{a(31a+9)}{(7a+6)(a-5)}, \text{ undefined @ } a = -6/7 + a = 5$$

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$$5) \quad \frac{8}{3} - \frac{n+8}{4n-8}$$

$$= \left(\frac{4n-8}{4n-8} \right) \left(\frac{8}{3} \right) - \left(\frac{n+8}{4(n-2)} \right) \left(\frac{3}{3} \right)$$

$$= \frac{(32n-64) - (3n+24)}{12(n-2)}$$

$$12(n-2) = 0 \\ n = 2$$

$$= \frac{29n - 88}{12(n-2)}, \text{ undefined @ } n = 2$$

$$6) \quad \frac{3n}{4} - \frac{5}{n+8}$$

$$= \left(\frac{n+8}{n+8} \right) \left(\frac{3n}{4} \right) - \left(\frac{5}{n+8} \right) \left(\frac{4}{4} \right)$$

$$4(n+8) = 0 \\ n = -8$$

$$= \frac{3n^2 + 24n - 20}{4(n+8)}, \text{ undefined @ } n = -8$$

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7)

$$\frac{k-7}{3k+12} - \frac{k+6}{2k}$$

$$= \frac{k-7}{3(k+4)} - \frac{k+6}{2k}$$

$$= \left(\frac{2k}{2k} \right) \left(\frac{k-7}{3(k+4)} \right) - \left(\frac{k+6}{2k} \right) \left(\frac{3(k+4)}{3(k+4)} \right)$$

$$= \frac{(2k^2 - 14k) - (3k^2 + 12k + 18k + 72)}{6k(k+4)}$$

$$= \frac{-k^2 - 44k - 72}{6k(k+4)}$$

$$(6k)(k+4) = 0$$

$$k=0 \text{ or } k=-4$$

$$= \frac{-(k^2 + 44k + 72)}{6k(k+4)}, \text{ undefined at } k=0 \text{ and } k=-4$$

8) $\frac{3n}{2n-5} - \frac{3}{5n+2}$

$$\left(\frac{5n+2}{5n+2}\right)\left(\frac{3n}{2n-5}\right) - \left(\frac{3}{5n+2}\right)\left(\frac{2n-5}{2n-5}\right)$$

$$= \frac{(15n^2 + 6n) - (6n - 15)}{(5n+2)(2n-5)}$$

$$= \frac{15n^2 - 15}{(5n+2)(2n-5)}$$

$$(5n+2)(2n-5) = 0$$

$$n = -2/5 \text{ or } n = 5/2$$

$$= \frac{15(n^2 - 1)}{(5n+2)(2n-5)}, \text{ undefined } @ n = -2/5 + n = 5/2$$

9) $\frac{6n-1}{n^2-9n+20} + \frac{n+1}{n^2-9n+20}$

$$\frac{(6n-1) + (n+1)}{(n-4)(n-5)}$$

$$(n-4)(n-5) = 0$$

$$n = 4 \text{ or } n = 5$$

$$= \frac{7n}{(n-4)(n-5)}, \text{ undefined } @ n = 4 + n = 5$$