Algebra 1: Problem Set 3 Simplifying rational expressions, arithmetic of rational expressions

1. $\dfrac{x^2+10x+16}{x^2+7x+10}\cdot\dfrac{x^2+x-20}{x^2-6x+8}$

2. $\dfrac{3x^2-5x-2}{x^2+3x}\div\dfrac{3x^2-8x-3}{x^2-3x}$

3. $\dfrac{3}{x+2}+\dfrac{4}{x}$

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

5. $\dfrac{1}{x+2}+\dfrac{1}{x+1}-\dfrac{2}{x-7}$

6. $\dfrac{2+\frac{1}{x}}{x-2}$

7. $\dfrac{\frac{1}{a}+\frac{1}{b}}{a^2-b^2}$

8. $\dfrac{3x}{x^2-6x-7}\div\dfrac{2x^2}{x^2-8x+7}$

Solutions to Odd Problems:

1.

$$\frac{x^2+10x+16}{x^2+7x+10}\cdot\frac{x^2+x-20}{x^2-6x+8}$$
$$\frac{(x+8)(x+2)}{(x+5)(x+2)}\bullet\frac{(x+5)(x-4)}{(x-2)(x-4)}$$
$$\frac{x+8}{x-2}$$

3.

$$\frac{3}{x+2}+\frac{4}{x}$$
$$\frac{3x}{x(x+2)}+\frac{4(x+2)}{x(x+2)}$$
$$\frac{3x+4x+8}{x(x+2)}$$
$$\frac{7x+8}{x(x+2)}$$

7.

$$\frac{\frac{1}{a}+\frac{1}{b}}{a^2-b^2}$$
$$\frac{\frac{1}{a}+\frac{1}{b}}{a^2-b^2}\cdot\frac{ab}{ab}$$
$$\frac{b+a}{(a+b)(a-b)ab}$$
$$\frac{1}{(a-b)ab}$$

5.

$$\frac{1}{x+2}+\frac{1}{x+1}-\frac{2}{x-7}$$
$$\frac{(x+1)(x-7)}{(x+2)(x+1)(x-7)}+\frac{(x+2)(x-7)}{(x+2)(x+1)(x-7)}-\frac{2(x+2)(x+1)}{(x+2)(x+1)(x-7)}$$
$$\frac{x^2-6x-7+x^2-5x-14-2(x^2+3x+2)}{(x+2)(x+1)(x-7)}$$
$$\frac{-17x-25}{(x+2)(x+1)(x-7)}$$

Answers to Evens:

2. $\dfrac{x-2}{x+3}$

4. $\dfrac{x^2+x-1}{(x-5)(x+4)}$

6. $\dfrac{2x+1}{x(x-2)}$

8. $\dfrac{3(x-1)}{2x(x+1)}$