Quiz - 2.3

Factor fully.

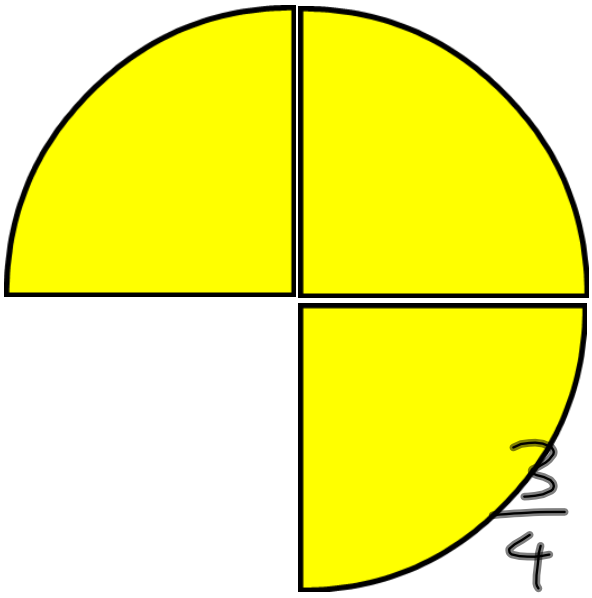
1. $6m^2 - 90m + 324$

2. $3x^2 - 27(2 - x)^2$

3. $12m^3 - 14m^2 - 30m + 35$

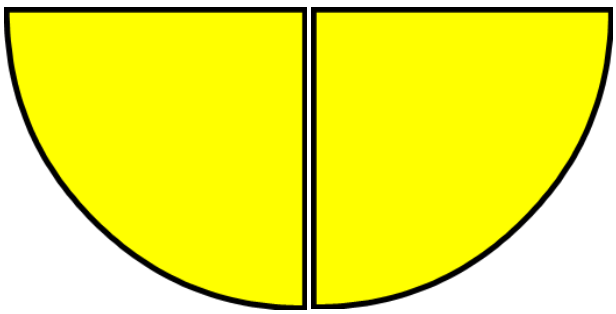
Adding and Subtracting Rational Expressions
2.7

CONGRATULATIONS MOURTADAH AND ABEBECH!!!!
YOUR PRIZE COMES TOMORROW!



$\frac{3}{4}$

$\frac{3}{4} + \frac{2}{4} = \frac{5}{4}$



$\frac{2}{4}$

Remember the Way We Add Fractions!

$$\frac{2}{5}+\frac{3}{25}+\frac{1}{10}$$

$$= \frac{2}{5} + \frac{3}{5\cdot 5} + \frac{1}{5\cdot 2}$$

$$= \frac{2\cdot 2}{5\cdot 5\cdot 2} + \frac{3\cdot 2}{5\cdot 5\cdot 2} + \frac{1\cdot 5}{5\cdot 5\cdot 2}$$

$$= \frac{20+6+5}{50}$$

$$= \frac{31}{50}$$

$$\frac{5}{21} + \frac{4}{7} + \frac{7}{15}$$

$$= \frac{5}{3 \cdot 7} + \frac{4}{7} + \frac{7}{3 \cdot 5}$$

$$= \frac{5 \cdot 5}{3 \cdot 7 \cdot 5} + \frac{4 \cdot 3 \cdot 5}{3 \cdot 7 \cdot 5} + \frac{7 \cdot 7}{3 \cdot 7 \cdot 5}$$

$$= \frac{25}{105} + \frac{60}{105} + \frac{49}{105}$$

$$= \frac{134}{105}$$

$$\frac{7}{9} + \frac{3}{12} + \frac{5}{4}$$

$$\frac{7}{3 \cdot 3} + \frac{3}{3 \cdot 2 \cdot 2} + \frac{5}{2 \cdot 2}$$

$$\frac{7 \cdot 2 \cdot 2}{3 \cdot 3 \cdot 2 \cdot 2} \quad \frac{3 \cdot 3}{3 \cdot 3 \cdot 2 \cdot 2} \quad \frac{5 \cdot 3 \cdot 3}{3 \cdot 3 \cdot 2 \cdot 2}$$

$$= \frac{28}{36} + \frac{9}{36} + \frac{45}{36}$$

$$= \frac{82}{36} = \frac{41}{18}$$

Remember the Way We Add Fractions!

$$\frac{2}{5}+\frac{3}{25}+\frac{1}{10}$$

The first multiple to occur in all three lists is 50, so this will be the common denominator.

$$\frac{2}{5}+\frac{3}{25}+\frac{1}{10}=\frac{2}{5}\cdot\frac{10}{10}+\frac{3}{25}\cdot\frac{2}{2}+\frac{1}{10}\cdot\frac{5}{5}$$

$$=\frac{20}{50}+\frac{6}{50}+\frac{5}{50}$$

$$=\frac{20+6+5}{50}$$

$$=\frac{31}{50}$$

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Example 1:

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

$$= \frac{2}{x} + \frac{3}{x \cdot x} + \frac{1}{2 \cdot x}$$

$$= \frac{2 \cdot 2x}{2x \cdot x} + \frac{3 \cdot 2}{2x \cdot x} + \frac{1 \cdot x}{2 \cdot x \cdot x}$$

$$= \frac{4x}{2x^2} + \frac{6}{2x^2} + \frac{x}{2x^2}$$

$$= \frac{5x+6}{2x^2}, \quad x \neq 0$$

Example 1:

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

$$\frac{2}{x}+\frac{3}{x^2}+\frac{1}{2x}=\frac{2}{x}\cdot\frac{2x}{2x}+\frac{3}{x^2}\cdot\frac{2}{2}+\frac{1}{2x}\cdot\frac{x}{x}$$

$$=\frac{4x}{2x^2}+\frac{6}{2x^2}+\frac{1x}{2x^2}$$

$$=\frac{4x+6+1x}{2x^2}$$

$$=\frac{5x+6}{2x^2}$$

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Example 2:

$$\frac{5x-1}{x+8} - \frac{3x+4}{x+8}$$

$$= \frac{5x-1-(3x+4)}{x+8}$$

$$= \frac{5x-1-3x-4}{x+8}$$

$$= \frac{2x-5}{x+8}, \quad x \neq -8$$

Example 2:

$$\frac{5x-1}{x+8}-\frac{3x+4}{x+8}$$

$$\frac{5x-1}{x+8}-\frac{3x+4}{x+8}=\frac{(5x-1)-(3x+4)}{x+8}$$

$$=\frac{5x-1-3x-4}{x+8}$$

$$=\frac{5x-3x-1-4}{x+8}$$

$$=\frac{2x-5}{x+8}$$

Example 3:

$$\frac{3x}{x^2+3x-10} - \frac{6}{x^2+3x-10}$$

$$= \frac{3x-6}{x^2+3x-10}$$

$$= \frac{3(x-2)}{(x+5)(x-2)}, \quad x \neq -5, 2$$

$$= \frac{3}{x+5}, \quad x \neq -5, 2$$

$\frac{3}{4} + \frac{2}{4} = \frac{5}{4}$

(2, 4)

Example 3:

$$\frac{3x}{x^2+3x-10}-\frac{6}{x^2+3x-10}$$

$$\frac{3x}{x^2+3x-10}-\frac{6}{x^2+3x-10}=\frac{3x-6}{x^2+3x-10}$$

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

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$$=\frac{3\cancel{(x-2)}}{(x+5)\cancel{(x-2)}}$$

$$=\frac{3}{x+5}$$

Example 4:

$$\frac{\frac{x+4}{2x}-\frac{x-1}{x^2}}{}$$

$$=\frac{(x+4)}{2\cdot x}-\frac{(x-1)}{x\cdot x}$$

$$=\frac{(x+4)\cdot x}{2x\cdot x}-\frac{(x-1)\cdot 2}{2\cdot x\cdot x}$$

$$=\frac{x\cdot(x+4)-2(x-1)}{2x^2}$$

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

$$=\frac{x^2+2x+2}{2x^2},\quad x\neq 0$$

Example 4:

$$\frac{x+4}{2x}-\frac{x-1}{x^2}$$

$$\frac{x+4}{2x}-\frac{x-1}{x^2}=\left(\frac{x+4}{2x}\right)\left(\frac{x}{x}\right)-\left(\frac{x-1}{x^2}\right)\left(\frac{2}{2}\right)$$

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

$$=\frac{\left(x^2+4x\right)-\left(2x-2\right)}{2x^2}$$

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

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

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Example 5:

$$\frac{4x}{2x-1} - \frac{5}{x-6}$$

$$= \frac{4x}{(2x-1)} - \frac{5}{(x-6)}$$

$$= \frac{4x(x-6)}{(2x-1)(x-6)} - \frac{5(2x-1)}{(2x-1)(x-6)}$$

$$= \frac{4x^2 - 34x + 5}{(2x-1)(x-6)}, \quad x \neq 6, \; x \neq \frac{1}{2}$$

$2x - 1 \neq 0$

$2x \neq 1$

$x \neq \frac{1}{2}$

Example 5:

$$\frac{4x}{2x-1}-\frac{5}{x-6}$$

$$\frac{4x}{2x-1}-\frac{5}{x-6}=\left(\frac{4x}{2x-1}\right)\left(\frac{x-6}{x-6}\right)-\left(\frac{5}{x-6}\right)\left(\frac{2x-1}{2x-1}\right)$$

$$=\frac{4x^2-24x}{(2x-1)(x-6)}-\frac{10x-5}{(2x-1)(x-6)}$$

$$=\frac{(4x^2-24x)-(10x-5)}{(2x-1)(x-6)}$$

$$=\frac{4x^2-24x-10x+5}{(2x-1)(x-6)}$$

$$=\frac{4x^2-34x+5}{(2x-1)(x-6)}$$

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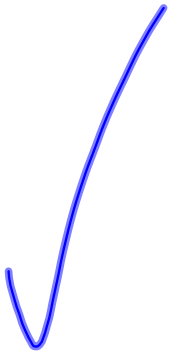

Example 6:

$$\frac{3}{x+2}+2$$

$$= \frac{3}{x+2} + \frac{2}{1}$$

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

$$= \frac{3+2x+4}{x+2}$$

$$= \frac{2x+7}{x+2}, \quad x \neq -2$$

Example 6:

$$\frac{3}{x+2}+2$$

$$\frac{3}{x+2}+2=\frac{3}{x+2}+\left(\frac{2}{1}\right)\left(\frac{x+2}{x+2}\right)$$

$$=\frac{3}{x+2}+\frac{2x+4}{x+2}$$

$$=\frac{3+2x+4}{x+2}$$

$$=\frac{2x+7}{x+2}$$

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Example 7:

$$\frac{1}{x+1}+\frac{x}{x-6}-\frac{5x-2}{x^2-5x-6}$$

$$=\frac{1}{x+1}+\frac{x}{x-6}-\frac{(5x-2)}{(x-6)(x+1)}$$

$$=\frac{x-6}{(x+1)(x-6)}+\frac{x(x+1)}{(x+1)(x-6)}-\frac{(5x-2)}{(x+1)(x-6)}$$

$$=\frac{x-6+x^2+x-5x+2}{(x+1)(x-6)}$$

$$=\frac{x^2-3x-4}{(x+1)(x-6)}=\frac{(x-4)(x+1)}{(x+1)(x-6)},\ x\neq -1,6$$

$$=\frac{x-4}{x-6},\ x\neq -1,6$$

Example 7:

$$\frac{1}{x+1}+\frac{x}{x-6}-\frac{5x-2}{x^2-5x-6}$$

$$\frac{1}{x+1}+\frac{x}{x-6}-\frac{5x-2}{x^2-5x-6}$$

$$=\frac{1}{x+1}+\frac{x}{x-6}-\frac{5x-2}{(x-6)(x+1)}$$

$$=\left(\frac{1}{x+1}\right)\left(\frac{x-6}{x-6}\right)+\left(\frac{x}{x-6}\right)\left(\frac{x+1}{x+1}\right)-\frac{5x-2}{(x-6)(x+1)}$$

$$=\frac{x-6}{(x-6)(x+1)}+\frac{x^2+x}{(x-6)(x+1)}-\frac{5x-2}{(x-6)(x+1)}$$

$$=\frac{(x-6)+(x^2+x)-(5x-2)}{(x-6)(x+1)}$$

$$=\frac{x-6+x^2+x-5x+2}{(x-6)(x+1)}$$

$$=\frac{x^2+x+x-5x-6+2}{(x-6)(x+1)}$$

$$=\frac{x^2-3x-4}{(x-6)(x+1)}$$

$$=\frac{(x+1)(x-4)}{(x-6)(x+1)}=\frac{\cancel{(x+1)}(x-4)}{(x-6)\cancel{(x+1)}}$$

$$=\frac{x-4}{x-6}$$

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Example 8:

$$\frac{3x+5}{x+5} - \frac{x+1}{2-x} - \frac{4x^2-3x-1}{x^2+3x-10}$$

HW
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1 3 5 9 13 16

Example 8 :

$$\frac{3x+5}{x+5}-\frac{x+1}{2-x}-\frac{4x^2-3x-1}{x^2+3x-10}$$

$$\frac{3x+5}{x+5}-\frac{x+1}{2-x}-\frac{4x^2-3x-1}{x^2+3x-10}$$

$$=\frac{3x+5}{x+5}-\frac{x+1}{2-x}-\frac{4x^2-3x-1}{(x+5)(x-2)}$$

$$=\frac{3x+5}{x+5}-\frac{x+1}{-(x-2)}-\frac{4x^2-3x-1}{(x+5)(x-2)}$$

$$=\frac{3x+5}{x+5}+\frac{x+1}{x-2}-\frac{4x^2-3x-1}{(x+5)(x-2)}$$

$$=\left(\frac{3x+5}{x+5}\right)\left(\frac{x-2}{x-2}\right)+\left(\frac{x+1}{x-2}\right)\left(\frac{x+5}{x+5}\right)-\frac{4x^2-3x-1}{(x+5)(x-2)}$$

$$=\frac{3x^2-x-10}{(x+5)(x-2)}+\frac{x^2+6x+5}{(x+5)(x-2)}-\frac{4x^2-3x-1}{(x+5)(x-2)}$$

$$=\frac{(3x^2-x-10)+(x^2+6x+5)-(4x^2-3x-1)}{(x+5)(x-2)}$$

$$=\frac{3x^2-x-10+x^2+6x+5-4x^2+3x+1}{(x+5)(x-2)}$$

$$=\frac{3x^2+x^2-4x^2-x+6x+3x-10+5+1}{(x+5)(x-2)}$$

$$=\frac{3x^2+x^2-4x^2-x+6x+3x-10+5+1}{(x+5)(x-2)}$$

$$=\frac{8x-4}{(x+5)(x-2)}=\frac{4(2x-1)}{(x+5)(x-2)}$$

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