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

$= \frac{x-1}{(x-3)(x+3)} + \frac{x+7}{(x-3)(x-2)}$

$= \frac{(x-1)(x-2)+(x+7)(x+3)}{(x-3)(x+3)(x-2)}$

$= \frac{x^2-3x+2+x^2+10x+21}{(x-3)(x+3)(x-2)}$

$= \frac{2x^2+7x+23}{(x-3)(x+3)(x-2)}$

R: $x \neq 3, -3, 2$

8a) $\frac{3}{4x^2+7x+3} - \frac{5}{16x^2+24x+9}$

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

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

$= \frac{12x+9-5x-5}{(4x+3)^2(x+1)}$

$= \frac{7x+4}{(4x+3)^2(x+1)}$

R: $x \neq -\frac{3}{4}, -1$

8c, 9a, c

8c) $\frac{3x+2}{4x^2-1} + \frac{2x-5}{4x^2+4x+1}$

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

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

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

$= \frac{10x^2-5x+7}{(2x-1)(2x+1)(2x+1)}$

R: $x \neq \pm\frac{1}{2}$

9a) $\frac{2x^3}{3y^2} \cdot \frac{3}{10x} - \frac{2y}{3x}$

$= \frac{x^2}{5y} - \frac{2y}{3x}$

$= \frac{3x^2(3x)-2y(5y)}{15xy}$

$= \frac{9x^3-10y^2}{15xy}$

R: $x \neq 0, y \neq 0$

9c) $\frac{p+1}{p^2+2p-35} + \frac{p^2+p-12}{p^2-2p-24} \times \frac{p^2-4p-12}{p^2+2p-15}$

$= \frac{p+1}{(p+7)(p-5)} + \frac{(p+4)(p-3)}{(p-6)(p+4)} \times \frac{(p-6)(p+2)}{(p+5)(p-3)}$

$\frac{(p+1)(p+5) + (p+2)(p+7)(p-5)}{(p+7)(p-5)(p+5)}$

$= \frac{p^2+6p+5 + (p+2)(p^2+2p-35)}{(p+7)(p-5)(p+5)}$

$= \frac{p^2+6p+5+p^3+2p^2-35p+2p^2+4p-70}{(p+7)(p-5)(p+5)}$

$= \frac{p^3+5p^2-25p-65}{(p+7)(p-5)(p+5)}$

R: $p \neq -7, 5, -4, -5, 3$

MCR 3UI Whiteboard Review for Unit 1 Test Date: Sept. 18/15

1. Simplify. $(3x-2)+(2x^2-5x+8)$

$= 3x - 2 + 2x^2 - 5x + 8$

$= 2x^2 - 2x + 6$

2. Simplify $(3x^2-5)^2-(2x^2+5x-4)$

$=9x^4-30x^2+25-2x^2-5x+4$

$=9x^4-32x^2-5x+29$

3. Determine if the following polynomials are equivalent.
Note: What are the two methods? Do they always work?

a) $y_1=3(x^2-4x+2)$

$=3x^2-12x+6$

or let $x=0$

$3(0-0+2)$

$=6$

b) $y_2=-2(x^2+4x-8)+5(x^2+1)-(4x+15)$

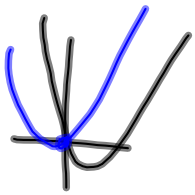
$=-2x^2-8x+16+5x^2+5-4x-15$

$=3x^2-12x+6$

$-2(0+0-8)+5(0+1)-(0+15)$

$=16+5-15$

$=6$



4. Simplify each of the following.

a) $3xy^2 \times \left(-2x^2y^3\right)$

$= -6x^3y^5$

b. $\dfrac{3x^2y \times -5xy^4}{-3x^4y^3}$

$= \dfrac{-5y^2}{-x}$

$= \dfrac{5y^2}{x}$

$= -\dfrac{5y^2}{x}$

$x \neq 0$
$y \neq 0$

5. Factor each polynomial completely.

a) $4x^4 - 16$

$= 4(x^4 - 4)$
$= 4(x^2-2)(x^2+2)$

b) $ab + b^2 + 6a + 6b$

$= b(a+b) + 6(a+b)$
$= (a+b)(b+6)$

c) $6x^2 + 5x - 4$

$= (2x-1)(3x+4)$

16 14
23 22

(2 2) (2 -1)
(3 2) (3 +4)

d) $y^2 + 9 - 6y - x^2$

$= y^2 - 6y + 9 - x^2$
$= (y-3)^2 - x^2$
$= (y-3-x)(y-3+x)$

$w^2 - x^2$
$(w-x)(w+x)$

1 2 1 4
1 2 6 1
6

6. Simplify. $\dfrac{3n^3-3n^2}{8n^3-12n^2+4n}$

$= \dfrac{3n^2(n-1)}{4n(2n^2-3n+1)}$

$= \dfrac{3n(n-1)}{4(2n-1)(n-1)}$

$\rightarrow \dfrac{3n}{4(2n-1)}$

$n \neq \frac{1}{2}, 1, 0$

7. Simplify.

$$\frac{x^2-4}{(x+6)^2} \times \frac{x^2+9x+18}{4-2x}$$

$= \dfrac{(x-2)(x+2)}{(x+6)(x+6)} \times \dfrac{(x+3)(x+6)}{-2(2+x)}$

$= \dfrac{(x+2)(x+3)}{-2(x+6)}$

$= \dfrac{x^2+3x+2x+6}{-2(x+6)}$

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

$x \neq -6, 2$

8. Simplify.

a. $\dfrac{3x^2}{x}+\dfrac{y}{2xy}-\dfrac{-2y^2}{x^2}$

$=\dfrac{6x^3y}{2x^2y}+\dfrac{xy}{2x^2y}-\dfrac{-4y^3}{2x^2y}$

$=\dfrac{6x^3y+xy+4y^3}{2x^2y}$

9. Simplify.

$\dfrac{5m-n}{2m+n}-\dfrac{4m^2-4mn+n^2}{4m^2-n^2}\div\dfrac{6m^2-mn-n^2}{3m+15n}$

$=\dfrac{5m-n}{2m+n}-\dfrac{(2m-n)^2}{(2m-n)(2m+n)}\div\dfrac{(3m+n)(2m-n)}{3(m+5n)}$

$=\dfrac{5m-n}{2m+n}-\dfrac{(2m-n)^2}{(2m-n)(2m+n)}\times\dfrac{3(m+5n)}{(3m+n)(2m-n)}$

$=\dfrac{5m-n}{2m+n}-\dfrac{3(m+5n)}{(2m+n)(3m+n)}$

$=\dfrac{(5m-n)(3m+n)-3(m+5n)}{(2m+n)(3m+n)}$

$=\dfrac{15m^2+5mn-3mn-n^2-3m-15n}{(2m+n)(3m+n)}$

$=\dfrac{15m^2+2mn-n^2-3m-15n}{(2m+n)(3m+n)}$

R: $m\neq\frac{1}{2}n,\ -\frac{1}{3}n,\ -5n$