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College Algebra Extra Credit 6/26

§R.7 Rational Expressions

LM p.86

R.7.4

Simplify $\frac{a-b}{b-a} = \frac{1}{(a-b)(-1)} = \frac{1}{-1} = -1$

R.7.13

Simplify $\frac{y^2-49}{4y^2-16y-84}$

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

$= \frac{y+7}{4(y+3)}$

SW

y^2-49

1. desc. order
2. GCF = 1
3. two terms
   - ★ diff. of sq.
   - ★ sum of cubes
   - ★ diff. of cubes

$a^2-b^2 = (a+b)(a-b)$

$y^2-49 = (y+7)(y-7)$

$4y^2-16y-84$

1. desc order ✓
2. GCF = 4

$4\left(\frac{4y^2}{4} - \frac{16y}{4} - \frac{84}{4}\right)$

$4(y^2-4y-21)$

3. three terms

$4(y-7)(y+3)$

livescribe

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LN p.86

R.7.4

Simplify $\frac{a-b}{b-a} \doteq \frac{1}{(a-b)(-1)} = \frac{1}{-1} = -1$

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Simplify $\frac{y^2-49}{4y^2-16y-84}$

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

$= \frac{y+7}{4(y+3)}$

SW

y^2-49

1. desc. order
2. GCF = 1
3. two terms
   - ★ diff. of sq
   - ★ s.m. of cubes
   - ★ diff of cubes

$a^2-b^2 = (a+b)(a-b)$

$y^2-49 = (y+7)(y-7)$

$4y^2-16y-84$

1. desc order ✓
2. GCF = 4

$4\left(\frac{4y^2}{4} - \frac{16y}{4} - \frac{84}{4}\right)$

$4(y^2-4y-21)$

3. three terms

$4(y-7)(y+3)$

Multiplying and Dividing Rational Expressions

R.7.21

$$\frac{10x^2}{x^2-16} \cdot \frac{x^3-64}{5x}$$

$$\frac{(2)(5)(x)(x)}{(x+4)(x-4)} \cdot \frac{(x-4)(x^2+4x+16)}{(5)(x)}$$

$$\frac{(2)(5)(x)(x)(x-4)(x^2+4x+16)}{(x+4)(x-4)(5)(x)}$$

$$\frac{2x(x^2+4x+16)}{x+4}$$

SW

$10x^2 = (2)(5)(x)(x)$

$5x = (5)(x)$

x^2-16 1. desc. ✓
$(x+4)(x-4)$ 2. GCF = 1
3. two terms

x^3-64 1. desc. ✓
2. GCF = 1 ✓
3. two terms diff. of cubes

a is x
b is 4

$a^3-b^3 = (a-b)(a^2+ab+b^2)$

$x^3-4^3 = (x-4)(x^2+x\cdot 4+4^2)$

$x^3-64 = (x-4)(x^2+4x+16)$

SW1

R.7.35

$$\frac{5x^2-26x-24}{6x^2-29x-5}$$

$$\frac{25x^2+50x+24}{6x^2+25x+4}$$

$5x^2-26x-24$

1. desc. ✓
2. GCF = 1
3. Trial terms (ed. guess and check)

$(5x+4)(x-6)$

$5x^2-30x+4x-24$

$$\frac{5x^2-26x-24}{6x^2-29x-5} \div \frac{25x^2+50x+24}{6x^2+25x+4}$$

$$\frac{5x^2-26x-24}{6x^2-29x-5}$$

here

$(5x+4)(x-6) \div$

1. desc
2. GCF
3. terms

$6x^2 - 29x - 5$

1. desc. ✓
2. GCF = 1 ✓
3. three terms

ed. y & c

$(6x + 5)(x - 5)$

$6x^2 - 5x + 5x - 5$

$6x^2 - x - 5$

$(6x + 1)(x - 5)$

$6x^2 - 30x + 1x - 5$

$6x^2 - 29x - 5$ ☺

$25x^2 + 50x + 24$

$5x \left| \dfrac{25x^2 + 20x}{5x} \right. \quad \left. \dfrac{+30x + 24}{6} \right\}$

$\dfrac{5x(5x+4) + 6(5x+4)}{5x+4}$ ← $5x+4$

$(5x+4)(5x+6)$

$25x^2 + 50x + 24$

1. desc. ✓
2. GCF = 1
3. three terms

"ac" method

$a = 25 \quad b = 50 \quad c = 24$

$a \cdot c = 600$

1	600	−1	−600
2	350	−2	−300
3	250		
4	150		
5	120		
6	100		
8	75		
10	60		
12	50		
15	40		
20	30		
24	25		

$\sqrt{600} \approx 24.$

$6x^2 + 25x + 4$

$(6x+1)(x+4)$

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

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

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