

# ReviewSol

June 21, 2014 2:24 PM

## (1.) Simplify, State Restrictions

a)  $\frac{x^2 - 25}{12x^3} \times \frac{9x}{2x^2 + 10x}$

b)  $\frac{3a^2 + 7a}{16 - a^2} \div \frac{14 + 6a}{3a + 12}$

c)  $\frac{9x^2 + 9x + 2}{3x^2 - x - 2} \times \frac{3x^2 - 4x + 1}{9x^2 - 1}$

d)  $\frac{4x^2 - 1}{2x^2 - 5x + 2} \div \frac{2x^2 - x - 1}{x^2 - 4}$

ANS #1

a)  $\frac{3(x-5)}{8x^3}$

b)  $\frac{3a}{2(4-a)}$

c) 1

d)  $\frac{x+2}{x-1}$

$x \neq 0, -5$

$a \neq \pm 4, \pm \frac{1}{3}$

$x \neq -\frac{2}{3}, 1, \pm \frac{1}{3}$

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

## (2.) Simplify, state restrictions.

a)  $\frac{2x^2 - 5x - 3}{5x^2 - 45} \times \frac{2x^2 - 6x - 36}{2x^2 - 11x - 6}$

b)  $\frac{3x^2 - 5x - 2}{2x^2 - 12x + 16} \times \frac{3x^2 - 24x + 48}{9x^2 - 1}$

c)  $\frac{2a^2 + a - 10}{5a^3 + 15a^2} \div \frac{4a^2 - 25}{2a^2 + a - 15}$

d)  $\frac{4x^2 - 12x + 9}{2x^2 - x - 3} \div \frac{x^2 - 2x + 1}{4x^2 - 4}$

ANS #2

a)  $\frac{2}{5}$

b)  $\frac{3(x-4)}{2(3x-1)}$

c)  $\frac{a-2}{5a^2}$

d)  $\frac{4(2x-3)}{x-1}$

$x \neq \pm 3, \pm \frac{1}{2}, 6$

$x \neq \pm \frac{1}{3}, 2, 4$

$a \neq 0, -3, \pm \frac{5}{2}$

$x \neq \pm 1, \frac{3}{2}$

## (3.) Simplify, state restrictions

a)  $\frac{3}{2a} + \frac{4}{6a}$

b)  $\frac{5}{m} + \frac{2}{m+3}$

c)  $\frac{x+2}{2x+1} - \frac{2x+1}{2x-1}$

d)  $\frac{6+m}{4(m+1)} + \frac{1+5m}{2(m-1)}$

e)  $\frac{y-5}{2(y+7)} - \frac{y+2}{y-3}$

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

ANS #3

a)  $\frac{13}{6a}, a \neq 0$

b)  $\frac{7m+15}{m(m+3)}, m \neq 0, -3$

c)  $\frac{-2x^2-x-3}{(2x-1)(2x+1)}, x \neq \frac{1}{2}$  and  $x \neq -\frac{1}{2}$

d)  $\frac{11m^2+17m-4}{4(m-1)(m+1)}, m \neq 1$  and  $m \neq -1$

e)  $\frac{-y^2-26y-13}{2(y+7)(y-3)}, y \neq 3$  and  $y \neq -7$

f)  $\frac{3x+4}{(x+2)(x-2)(x+1)}, x \neq 2, x \neq -2,$  and  $x \neq -1$

## (10.) Completely factor so that remaining factors have only integer coefficients.

a)  $u^3 + 27v^3 = (u+3v)(u^2 - 3uv + 9v^2)$

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

⊙ completing square ... coefficients. ⊙

a)  $u^3 + 27v^3 = (u+3v)(u^2 - 3uv + 9v^2)$  b)  $64x^3 - y^3 = (4x-y)(16x^2 + 4xy + y^2)$

c)  $3x^2 - 5x + 2 = (3x-2)(x-1)$  d)  $2x^2 - x - 1 = (2x+1)(x-1)$

e)  $5x^2 + 26x + 5 = (5x+1)(x+5)$  f)  $12x^2 + 7x + 1 = (3x+1)(4x+1)$

g)  $\frac{1}{2}x^3 + 2x^2 - 5x$

h)  $\frac{1}{3}y^4 - 5y^2 + 2y$

i)  $\frac{2}{3}x(x-3) - 4(x-3)$

j)  $\frac{4}{5}y(y+1) - 2(y+1)$

g)  $\frac{1}{2}x(x^2 + 4x - 10)$  ← factored over integers

factored over reals  $\left\{ \begin{array}{l} \frac{1}{2}x \left( x - \left( \frac{-4 + \sqrt{56}}{2} \right) \right) \left( x - \left( \frac{-4 - \sqrt{56}}{2} \right) \right) \\ \frac{1}{2}x (x + 2 - \sqrt{14})(x + 2 + \sqrt{14}) \end{array} \right.$  using quadratic formula.

h)  $\frac{1}{3}y(y^3 - 15y + 6)$

i)  $\frac{2}{3}(x-3)(x-6)$

j)  $\frac{2}{5}(y+1)(2y-5)$

k)  $(t-1)^2 - 49$

k)  $[(t-)+7][(t-)-7]$  by diff. of sq.

l)  $[(x^2+1)-2x][(x^2+1)+2x]$

l)  $(x^2 + 1)^2 - 4x^2$

$= (t+6)(t-8)$

$= (x^2 - 2x + 1)(x^2 + 2x + 1)$   
 $= (x-1)^2(x+1)^2$

m)  $2x(x-5)^4 - x^2(4)(x-5)^3$

n)  $5(x^6 + 1)^4(6x^5)(3x + 2)^3 + 3(3x + 2)^2(3)(x^6 + 1)^5$

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

m)  $2x(x-5)^3[(x-5) - 2x]$   
 $= 2x(x-5)^3(-x-5)$   
 $= -2x(x-5)^3(x+5)$

n)  $3(x^6+1)^4(3x+2)^2 [5(2)x^5(3x+2) + 3(x^6+1)]$   
 $= 3(x^6+1)^4(3x+2)^2 [30x^6 + 20x^5 + 3x^6 + 3]$   
 $= 3(x^6+1)^4(3x+2)^2 [33x^6 + 20x^5 + 3]$

o)  $\frac{1}{2}(x^2+1)^4 [x^2 - 2(x^2+1)]$   
 $= \frac{1}{2}(x^2+1)^4 (x^2 - 2x^2 - 2)$   
 $= \frac{1}{2}(x^2+1)^4 (-x^2 - 2)$   
 $= -\frac{1}{2}(x^2+1)^4 (x^2 + 2)$