6HD3, 15.3.2018

① a) $-3+[2-\{-7-(-2+5)\}]$

$= -3+[2-\{-7+2-5\}]$ $\quad -7+2-5=-10$

$= -3+[2-\{-10\}]$

$= -3+[2+10] = -3+12 = \underline{9}$

b) $-3y+[-2x-5y-\{-5x-(-2x+3y)\}]$

$= -3y+[-2x-5y-\{\underbrace{-5x+2x-3y}_{-3x-3y}\}]$

$= -3y+[-2x-5y+3x+3y]$

$= -3y-\underline{2x}-5y+\underline{3x}+3y = \underline{x-5y}$

② a) $-x\cdot(-x)^2 = -x\cdot x^2 = \underline{-x^3}$

b) $-(-a)^2 = -(-a)(-a) = \underline{-a^2}$

c) $-5^2\cdot(-5^2) = \underline{5^4}$

d) $(-5)^7 = \underline{-5^7}$

(3) a) $2a^2+8a+8 = 2(a^2+4a+4) = \underline{\underline{2(a+2)^2}}$

b) $a^2bc + ab^2c - abc^2 = \underline{\underline{abc(a+b+c)}}$

c) $x^3 - xy^2 = x(x^2-y^2) = \underline{\underline{x(x+y)(x-y)}}$

d) $4x^2 + 20xy + 25y^2 = \underline{\underline{(2x+5y)^2}}$

e) $3x^2y - 12xy + 12y = \underline{3y(x^2-4x+4)}$

$= \underline{\underline{3y(x-2)^2}}$

f) $a^2+3a-10 =$

$\underline{\underline{(a-2)(a+5)}}$

g) $5p^3q - 5pq^3 = 5pq(p^2-q^2)$

$= \underline{\underline{5pq(p+q)(p-q)}}$

h) $2x^2 - 18x + 28 = 2(x^2-9x+14)$

$= \underline{\underline{2(x-2)(x-7)}}$

(4) a) $\frac{a^2-ab}{b^2-ab} = \frac{a(a-b)}{b(b-a)} = \frac{a(a-b)}{-b(a-b)}$

$= -\frac{a}{b}$

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

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

d) $\frac{6a^2-6a-36}{3a^2-27} = \frac{6(a^2-a-6)}{3(a^2-9)}$

$= \frac{6(a-3)(a+2)}{3(a+3)(a-3)} = \frac{2(a+2)}{a+3}$

(6) $(x+5)(x-3) = 65$

$x^2+2x-15 = 65 \quad /-65$

$x^2+2x-80 = 0$

$(x-8)(x+10) = 0$

$x-8=0 \qquad x+10=0$

$x_1 = 8 \qquad x = -10$

$\mathbb{L} = \{-10; 8\}$

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

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

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

$= \frac{1}{x(x+1)}$

b) $1 - \frac{x}{x+1} = \frac{x+1}{x+1} - \frac{x}{x+1} = \frac{x+1-x}{x+1}$

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

c) $\frac{2a}{a^2-9} - \frac{3}{2a-6} = \frac{2a}{(a+3)(a-3)} - \frac{3}{2(a-3)}$

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

$= \frac{4a-3(a+3)}{11} = \frac{4a-(3a+9)}{4}$

$= \frac{4a-3a-9}{4} = \frac{a-9}{2(a+3)(a-3)}$

d) $\frac{2}{x-5} - \frac{8}{x^2-x-20} = \frac{2}{x-5} - \frac{8}{(x-5)(x+4)} = \frac{2(x+4)-8}{(x-5)(x+4)}$

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