

Algebra 2 CH 9 Review C

① $y = \frac{k}{x}$

$9 = \frac{k}{-1}$
 $-9 = k$

$y = \frac{-9}{x}$

$y = \frac{-9}{3}$
 $y = -3$

② $y = \frac{k}{x}$

$\frac{5}{3} = \frac{k}{3/5}$
 $1 = k$

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

$y = \frac{1}{3}$

③ $y = \frac{k}{x}$

$y = \frac{-2}{x}$
 $\frac{1}{3} = \frac{k}{-6}$
 $-2 = k$

④ $z = kxy$
 $-1 = k(4)(2)$

$-1 = 8k$
 $-1/8 = k$

$z = -\frac{1}{8}xy$

$z = -\frac{1}{8}(2)(3)$

$z = -\frac{6}{8}$

$z = -\frac{3}{4}$

⑤ $z = kxy$
 $\frac{3}{2} = k(\frac{1}{2})(\frac{1}{3})$

$\frac{3}{2} = k \frac{1}{6}$

$9 = k$
 $z = 9xy$

$z = 9(2)(3)$

$z = 54$

⑥ $xy = 2$
 $y = \frac{2}{x}$

x	y
-2	-1
-1	-2
0	undef
1	2
2	1

→ rational function in the form

$y = \frac{a}{x-h} + k$

vert asympt: $x=h$
 horiz asympt: $y=k$

⑦ $y = \frac{2}{x-2}$

x	y
0	-1
1	-2
2	undef
3	2
4	1

horiz asympt: x -axis
 vertical asympt: $x=2$

⑧ $y = \frac{2x}{x-4}$ → rational function in the form

$y = \frac{ax+b}{cx+d}$

vert asympt: what makes x value of denom.

horiz asympt: $\frac{a}{c}$

vert asympt: $x=4$

horiz asympt: $y=2$

x	y
1	-2/3
2	-2
3	-6
4	undef
5	10
6	6
7	4 2/3

⑨ $y = \frac{4}{x^2}$ → rational function in the form $f(x) = \frac{p(x)}{q(x)}$

vert asympt: zero of denom.

horiz asympt:

$m < n$ $y=0$

$m = n$ $y = \frac{am}{bn}$

$m > n$ NONE

x	y
-2	1
-1	4
0	undef
1	4
2	1

vert asympt: y -axis
 horiz asympt: $y=0$
 ($m < n$)

⑩ $y = \frac{-2x^2}{x-2}$ $m > n$
 horiz asym: none
 vertic. asym: $x=2$
 end behavior
 $y = \frac{-2x^2}{x}$
 $y = -2x$
 (graph)

x	y
0	0
1	2
2	undef
3	-18
4	-16

⑪ $y = \frac{x^2 - 3x + 5}{x+1}$ $m > n$
 horiz asym: none
 vert asym: $x=-1$
 end behavior
 $y = \frac{x^2}{x}$

x	y
-3	-2.5
-2	-7
-1	undef
0	5
1	1.5
2	1

⑫ $\frac{5}{x} + \frac{3}{y} - \frac{2}{z} = \frac{5}{x} \cdot \frac{yz}{yz} + \frac{3}{y} \cdot \frac{xz}{xz} - \frac{2}{z} \cdot \frac{xy}{xy} = \frac{5yz + 3zx - 2xy}{xyz}$
 LCD = xyz

⑬ $\frac{3x-5}{x^2-9} + \frac{7-x}{9-x^2} - \frac{1}{x+3} = \frac{3x-5}{(x-3)(x+3)} \cdot \frac{-1}{-1} + \frac{7-x}{-1(x-3)(x+3)} - \frac{1}{x+3} \cdot \frac{-1(x-3)}{-1(x-3)}$
 LCD: $-1(x-3)(x+3)$
 $= \frac{-3x+5+7-x+x-3}{-1(x-3)(x+3)} = \frac{-3x+9}{-1(x-3)(x+3)}$
 $= \frac{-3(x-3)}{-1(x-3)(x+3)} = \frac{3}{x+3}$

⑭ $\frac{3y-5}{2y-6} - \frac{4y-2}{5y-15} = \frac{3y-5}{2(y-3)} \cdot \frac{5}{5} - \frac{4y-2}{5(y-3)} \cdot \frac{2}{2} = \frac{15y-25-8y+4}{10(y-3)}$
 LCD: $10(y-3)$
 $= \frac{7y-21}{10(y-3)} = \frac{7(y-3)}{10(y-3)} = \frac{7}{10}$

⑮ $30x^3 - 6x^2 \div \frac{15x^2 - 3x}{4x^2 + 4x - 24} = 6x^2(5x-1) \div \frac{3x(5x-1)}{4(x^2+x-6)}$
 $= \frac{2 \cdot 6x^2(5x-1) \cdot 4(x+3)(x-2)}{3x(5x-1)} = 8x(x+3)(x-2)$

$$\begin{aligned}
 (16) \quad \frac{3x}{2x-3} + \frac{3x+6}{2x^2+x-6} &= \frac{3x(x+2)}{(2x-3)(x+2)} + \frac{3x+6}{(2x-3)(x+2)} = \frac{3x^2+6x+3x+6}{(2x-3)(x+2)} \\
 &= \frac{3x^2+9x+6}{(2x-3)(x+2)} = \frac{3(x^2+3x+2)}{(2x-3)(x+2)} = \frac{3(x+1)(x+2)}{(2x-3)(x+2)} \\
 &= \frac{3(x+1)}{2x-3}
 \end{aligned}$$

$$\begin{aligned}
 (17) \quad \frac{6x^2+x-2}{6x^2+7x+2} \cdot \frac{2x^2+9x+4}{4-7x-2x^2} &= \frac{(2x-1)(3x+2)}{(2x+1)(3x+2)} \cdot \frac{(2x+1)(x+4)}{-1(2x-1)(x+4)} \\
 &= -1
 \end{aligned}$$

$$\begin{aligned}
 (18) \quad \left[\frac{1}{5x^2} - \frac{2}{y} \right] \div \left[\frac{7}{10x} + \frac{3}{2y^2} \right] &= \left[\frac{1}{5x^2} \cdot \frac{y}{y} - \frac{2}{y} \cdot \frac{5x^2}{5x^2} \right] \div \left[\frac{7}{10x} \cdot \frac{y^2}{y^2} + \frac{3}{2y^2} \cdot \frac{5x}{5x} \right] \\
 &= \frac{y-10x^2}{5x^2y} \div \frac{7y^2+15x}{10xy^2} = \frac{y-10x^2}{5x^2y} \cdot \frac{10xy^2}{7y^2+15x} = \frac{(y-10x^2)(2y)}{x(7y^2+15x)} \\
 &= \frac{2y^2-20x^2y}{7xy^2+15x^2}
 \end{aligned}$$

$$\begin{aligned}
 (19) \quad \frac{10}{x+1} \div \frac{1}{2} + \frac{3}{x+1} &= \frac{10}{x+1} \div \left[\frac{1}{2} \cdot \frac{x+1}{x+1} + \frac{3}{x+1} \cdot \frac{2}{2} \right] = \frac{10}{x+1} \div \frac{x+1+6}{2(x+1)} \\
 &= \frac{10}{x+1} \cdot \frac{2(x+1)}{x+7} = \frac{20}{x+7}
 \end{aligned}$$

$$\begin{aligned}
 (20) \quad 2 - \left[2 \div 2 - \frac{2}{2-x} \right] &= 2 - \left[2 \div \frac{2(2-x)-2}{2-x} \right] = 2 - \left[2 \div \frac{4-2x-2}{2-x} \right] \\
 &= 2 - \left[2 \div \frac{2-2x}{2-x} \right] = 2 - \left[\frac{2 \cdot (2-x)}{2(1-x)} \right] = \\
 &= 2 - \frac{(2-x)}{1-x} = \frac{2(1-x) - (2-x)}{1-x} = \frac{2-2x-2+x}{1-x} = \frac{-x}{1-x} \text{ or } \\
 &= \frac{x}{x-1}
 \end{aligned}$$

$$\textcircled{21} \quad \frac{2}{x} = \frac{x}{x^2-8} \quad 2(x^2-8) = x^2 \quad x=4$$

$$2x^2 - 16 = x^2 \quad x = -4$$

$$x^2 - 16 = 0$$

$$(x-4)(x+4)$$

$$\textcircled{22} \quad \frac{3}{x-2} = \frac{4}{x-3} - \frac{6}{x^2-5x+6} = \frac{3}{x-2} = \frac{4(x-2)-6}{(x-2)(x-3)} = \frac{4x-8-6}{(x-2)(x-3)}$$

$$\frac{3}{x-2} = \frac{4x-14}{(x-2)(x-3)} = \frac{3(x-2)(x-3)}{(x-2)(x-3)} = \frac{(x-2)(4x-14)}{(x-2)(x-3)}$$

$$3(x^2-5x+6) = 4x^2 - 14x - 8x + 28$$

$$3x^2 - 15x + 18 = 4x^2 - 22x + 28$$

$$= x^2 - 7x + 10$$

$$= (x-2)(x-5)$$

$$x = 2 \leftarrow \text{extraneous}$$

$$x = 5$$

$$\textcircled{23} \quad \frac{3}{x+1} + \frac{x-2}{3} = \frac{13}{3x+3} \quad \frac{3 \cdot 3 + (x-2)(x+1)}{3(x+1)} = \frac{13}{3x+3}$$

$$\frac{9 + x^2 - x - 2}{3x+3} = \frac{13}{3x+3} \quad \frac{x^2 - x + 7}{3x+3} = \frac{13}{3x+3} \quad * \text{mult each side by } 3x+3.$$

$$= x^2 - x + 7 = 13$$

$$x^2 - x - 6 = 0 \quad x = -2$$

$$(x+2)(x-3) \quad x = 3$$

$$\textcircled{24} \quad \frac{x-3}{z} = \frac{x}{y} \quad \frac{y(x-3)}{x} = \frac{xz}{x} \quad z = \frac{y(x-3)}{x}$$

$$\textcircled{25} \quad 10x - (750 + 4.25x) > 0$$

$$10x - 750 - 4.25x > 0$$

$$5.75x > 750$$

$$x > 130 \text{ boxes}$$