Key to Review sheet for Exam 2

① $$\frac{8a^2-8ab}{16a^3-16a^2b} = \frac{\cancel{8a}\cancel{(a-b)}}{\underset{2}{\cancel{16}}\cancel{a}^2\cancel{(a-b)}} = \frac{1}{2a} \qquad a \neq b, 0$$

② $$\frac{6k^2-30k}{15+7k-2k^2} = \frac{6k^2-30k}{-(2k^2-7k-15)} = \frac{6k\cancel{(k-5)}}{-(2k+3)\cancel{(k-5)}}$$

$$-(2k^2-10k+3k-15)$$

$$-(2k(k-5)+3(k-5)) \qquad = \frac{6k}{-(2k+3)} \qquad k \neq 5, \frac{-3}{2}$$

$$-(2k+3)(k-5)$$

③ $$\frac{4h^2}{h^2-h} = \frac{4h^{\cancel{2}}}{h(h-1)} = \frac{4h}{h-1} \qquad h \neq 0,1$$

④ $$\frac{x^2y+xy^2}{x^3-4x^2y} \cdot \frac{xy-4y^2}{xy^2+2y^3} = \frac{\cancel{xy}(x+y)}{x^{\cancel{2}}\cancel{(x-4y)}} \cdot \frac{\cancel{y}\cancel{(x-4y)}}{\cancel{y^2}(x+2y)}$$

$$= \frac{x+y}{x(x+2y)} \qquad \begin{array}{l} x,y \neq 0 \\ x \neq 4y, -2y \end{array}$$

⑤ $\frac{a^2-ab}{ab+2b^3} \div \frac{a^2+ab}{ab+b^2} = \frac{\cancel{a}(a-b)}{\cancel{b}(a+2b^2)} \cdot \frac{\cancel{b}(\cancel{a+b})}{\cancel{a}(\cancel{a+b})}$

$\frac{a-b}{a+2b^2}$ $\quad a \neq -2b^2, -b$

$a, b \neq 0$

⑥* $\frac{(2x+1)\cancel{(x+1)}}{\cancel{(x+2)}\cancel{(x+1)}} \cdot \frac{\cancel{(x+3)}\cancel{(x+2)}}{(x+3)^{\cancel{2}}}$

$2x^2+2x+x+1$

$2x(x+1)+1(x+1)$

$(2x+1)(x+1)$

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

⑦ $\frac{\cancel{(2y-1)}\cancel{(2y+1)}}{y(y^2+3y+2)} \cdot \frac{\cancel{(y-3)}\cancel{(y+1)}}{{*}\ \cancel{(2y+1)}\cancel{(y-3)}} \cdot \frac{\cancel{(3y+1)}\cancel{(y+2)}}{{*}\ -\cancel{(3y+1)}\cancel{(2y-1)}}$ *

$y\,\cancel{(y+1)}\cancel{(y+2)}$

$\frac{1}{-y}$ $\quad y \neq 0, -1, -2, \pm\frac{1}{2}, 3, -\frac{1}{3}$

---

* $2y^2-6y+y-3$

$2y(y-3)+1(y-3)$

$(2y+1)(y-3)$

* $-6y^2+y+1$

$-(6y^2-y-1)$

$-(6y^2-3y+2y-1)$

$-(3y(2y-1)+1(2y-1))$

$-(3y+1)(2y-1)$

* $3y^2+7y+2$

$3y^2+6y+y+2$

$3y(y+2)+1(y+2)$

$(3y+1)(y+2)$

⑧ $\frac{2(y-3)}{2\,(y+4)(y-1)} + \frac{2y+1}{2(y^2+3y-4)}$

$2(y+4)(y-1)$

$$\frac{2y-6+2y+1}{2(y+4)(y-1)} = \frac{4y-5}{2(y+4)(y-1)} \quad y \neq -4, 1$$

⑨ $\frac{(y-3)\,y}{(y-3)\,(y+2)} + \frac{-2\,(-1)(y+2)}{(3-y)(-1)\,(y+2)} + \frac{-3y\mp 1}{y^2-y-6}$

$(y-3)(y+2)$

$$\frac{y^2-3y+2y+4-3y-1}{(y+2)(y-3)} = \frac{y^2-4y+3}{(y+2)(y-3)}$$

$$\frac{(y-3)(y-1)}{(y+2)(y-3)}$$

$$\frac{y-1}{y+2} \quad y \neq -2, 3$$

⑩
$$\frac{\frac{2}{\cancel{x}}\,6xwz - \frac{1}{2\cancel{z}}\,\overset{3}{\cancel{6}}xw\cancel{z}}{6x\cancel{w}z\,\frac{3}{\cancel{w}} - \frac{1}{3\cancel{z}}\,\overset{2}{\cancel{6}}xw\cancel{z}}$$

$$\frac{12wz-3wx}{18xz-2wx}$$

$$\frac{3w(4z-x)}{2x(9z-w)} \qquad x,w,z\neq 0 \quad w\neq 9z$$

⑪
$$\frac{x^2\,4-\frac{1}{x^2}\,x^2}{x^2\,\frac{2}{\cancel{x}}-\frac{1}{x^2}\,x^2}$$

$$\frac{4x^2-1}{2x-1}=\frac{\cancel{(2x-1)}(2x+1)}{\cancel{2x-1}}=2x+1 \qquad x\neq 0,\tfrac{1}{2}$$

⑫ $$\frac{\frac{x^3}{\cancel{x+1}}\,(x+1)(x+1)}{\frac{x}{(x+1)\cancel{(x+1)}}\,(x+1)\cancel{(x+1)}} = \frac{x^{\overset{2}{\cancel{3}}}(x+1)}{\cancel{x}}$$

$x^2(x+1)$ $x \neq -1, 0$

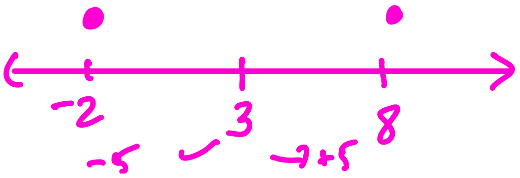
⑬ $$\frac{\overset{(x-1)(x+1)}{1} + \frac{-1}{1-\cancel{x}}\;\overset{-1}{(\cancel{x}-1)}(x+1)}{(x-1)(x+1)\,16 + \frac{7}{\underset{(x-1)\cancel{(x+1)}}{x^2-1}}\;(x-1)\cancel{(x+1)}}$$

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

$$\frac{x^2 \cancel{-1} + x \cancel{+1}}{16x^2 - 16 + 7} = \frac{x^2+x}{16x^2-9} = \frac{x(x+1)}{(4x-3)(4x+3)}$$

⑭ $|x-3| = 5$

x's distance from 3 is 5



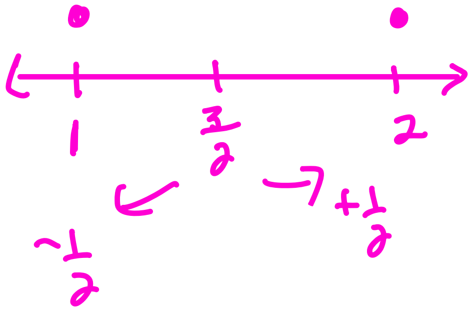
$\{-2, 8\}$

⑮ $|2x-3| = 1$

$2\left|x-\frac{3}{2}\right| = 1$

$\left|x-\frac{3}{2}\right| = \frac{1}{2}$

x's distance from $\frac{3}{2}$ is $\frac{1}{2}$



$\{1, 2\}$

⑯ $|7-3x| \le 6$

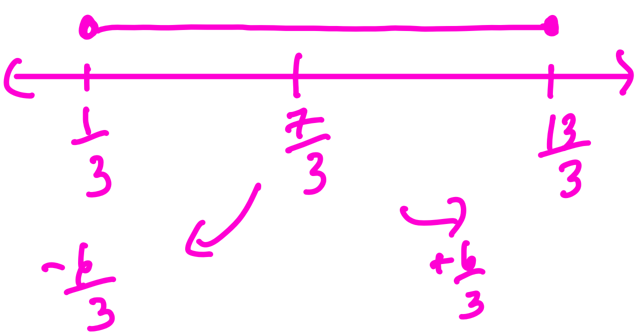
$|3x-7| \le 6$

$3\left|x-\frac{7}{3}\right| \le 6$

$|x-7/3| \le \frac{6}{3}$

$* \; |7-3x| = |3x-7| \; *$

x's distance from $7/3 \le 6/3$



SB: $\{x \mid \frac{1}{3} \le x \le 13/3\}$

IN: $[\frac{1}{3}, \frac{13}{3}]$

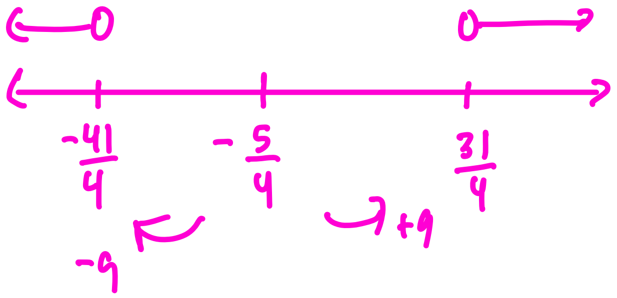
⑰ $\left|\frac{5}{6}+\frac{2}{3}x\right|>6$

$\left|\frac{2}{3}x+\frac{5}{6}\right|>6$

$\frac{2}{3}\left|x+\frac{5}{4}\right|>6$

$\left|x+\frac{5}{4}\right|>9$

x's distance from $-\frac{5}{4}$ >9



SB: $\{x \mid x<-\frac{41}{4}$ or $x>\frac{31}{4}\}$

IN: $(-\infty, -\frac{41}{4})$ or $(\frac{31}{4}, \infty)$

⑱ $|3x-4|<-1$

no solution

(absolute value can not be less than a negative #)

⑲ $|2x-5|\geq 0$

infinite solutions

(absolute value is always greater than or = 0)

Name: ____ Date: ________

PC: Review Sheet for Exam 2 Q1 Part 2 Ms. Loughran

1. Simplify: $\dfrac{a^{-1}+2a^{-2}}{2a^{-1}+(2a)^{-1}}$

$$\frac{2a^{\cancel{2}}\,\frac{1}{\cancel{a}} + \frac{2}{\cancel{a^{2}}}\,2\cancel{a^{2}}}{2a^{\cancel{2}}\,\frac{2}{\cancel{a}} + \frac{1}{\cancel{2a}}\,\cancel{2a}^{2}}$$

$$\frac{2a+4}{4a+a}$$

$$\frac{2a+4}{5a}\,,\ a\neq 0$$

2. Simplify: * $\dfrac{x^2+2xy+y^2}{y^2-x^2}$ ÷ * $\dfrac{x^2-2xy-3y^2}{2x^2-xy-y^2}$ *

$$\frac{\cancel{(x+y)}\cancel{(x+y)}}{\cancel{(y-x)}\cancel{(y+x)}}\cdot\frac{(2x+y)\overset{-1}{\cancel{(x-y)}}}{\cancel{(x+y)}(x-3y)} = -\frac{(2x+y)}{x-3y}\qquad y\neq\pm x,-2x \quad x\neq 3y$$

* $x^2+xy+xy+y^2$

$x(x+y)+y(x+y)$

$(x+y)(x+y)$

* $x^2-3xy+xy-3y^2$

$x(x-3y)+y(x-3y)$

$(x+y)(x-3y)$

* $2x^2-2xy+xy-y^2$

$2x(x-y)+y(x-y)$

$(2x+y)(x-y)$