Trig 4.6

Solve rational equations
Solve rational inequalities

Whiteboards: (if time)

$\frac{b}{2} + 2 = 5$

Solve each equation or inequality.

1. $\frac{6}{x} + x = 5$

$y(y-1)$ $y(y-1)$ $y(y-1)$

2. $\frac{7}{y-1} - \frac{4}{y} = \frac{y}{y-1}$

1. Clear denom
2. Solve
3. Check answers

$6 + x^2 = 5x$

$x^2 - 5x + 6 = 0$

$\underset{-3}{\overset{6}{\diagdown}}\underset{-5}{\overset{-2}{\diagup}}$ $(x-3)(x-2) = 0$

$x = 3$ $x = 2$

$^7y - 4(y-1) = y^2$

$7y - 4y + 4 = y^2$

$0 = y^2 - 3y - 4$

$\underset{-3}{\overset{-4}{\diagup}}\overset{1}{\diagdown}$

$(y-4)(y+1) = 0$

$y = 4$ $y = -1$

5. $\dfrac{1}{3w} + \dfrac{4}{5w} \leq \dfrac{1}{15}$
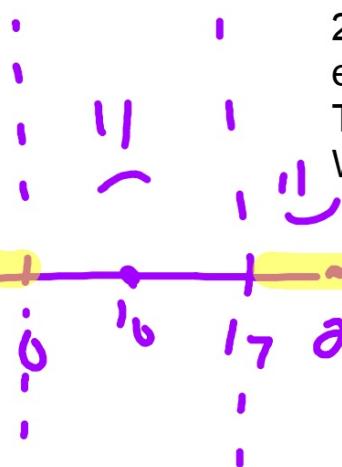
6. $\dfrac{x-2}{x} < \dfrac{x-4}{x-6}$

Use related equations:
1. find excluded values *denom*
2. find solutions to related equation
Test intervals (test point)
Where is it true?

$$\frac{1}{60} + \frac{4}{100} \leq \frac{1}{15}$$

$$0.0566 \overset{?}{\leq} 0.06 \;\checkmark$$

$x < 0$

$-2 \quad 0 \quad 6 \quad 17 \quad 20$

$x \geq 17$

$$\frac{\cancel{x(x-6)}\ \ x-2}{\cancel{x}} = \overset{(x)(\cancel{x-6})}{<} \frac{x-4}{\cancel{x-6}}$$
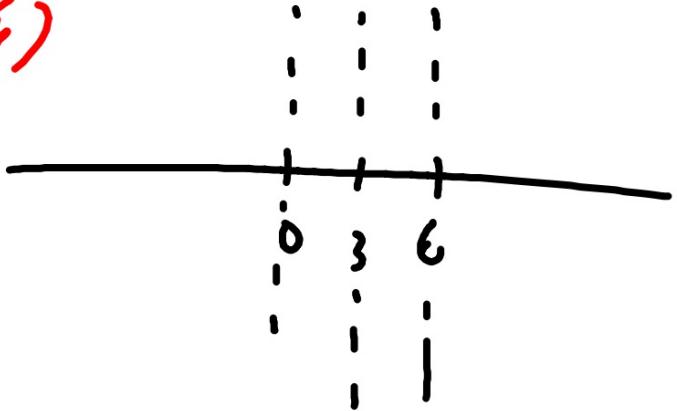
$$(x-6)(x-2) = x(x-4)$$

$$\cancel{x^2}-8x+12 = \cancel{x^2}-4x$$

$$\underline{+8x \qquad\qquad +8x}$$

$$X = 3 \qquad 12 = 4x$$

10. $1 + \dfrac{5}{a - 1} \leq \dfrac{7}{6}$

1. find excluded values
2. find solutions to related equation
3. test intervals on number line
4. Where is it true? < > etc.

29. $\dfrac{(x-3)(x-4)}{(x-5)(x-6)^2} \leq 0$

WB 4.6