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Extra Credit Session MAT1033C Jan. 14, 2020

Learning Workbook p 138

How to find a least common multiple or least common denominator.

Three Methods

1. If the larger is evenly divisible by the smaller, then the larger is the LCM/LCD
2. List multiples of the largest until you find one divisible by the others
3. Write prime factorization of each, then make columns. (Details will be provided)

Method 1

The LCM of 5 and 10 is 10.

The LCD of $\frac{1}{7}$ and $\frac{4}{21}$ is 21.

Method 2

The LCM of 3, 4 and 5 is ... ?

~~5~~, ~~10~~, ~~15~~, ~~20~~, ~~25~~, ~~30~~, ~~35~~, ~~40~~, ~~45~~, ~~50~~, ~~55~~, (60)

The LCD of $\frac{1}{2}$, $\frac{1}{7}$, $\frac{1}{4}$ is ... ?

~~7~~, ~~14~~, ~~21~~, (28), 35, 42, 49, 56, 63, 70...

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Method 3

$$\frac{1}{4x}, \quad \frac{3}{6y^2}, \quad \frac{5}{12x^2y}$$

Find the LCD

$4x = 2 \cdot 2 \cdot x$

$6y^2 = 2 \cdot 3 \cdot y \cdot y$

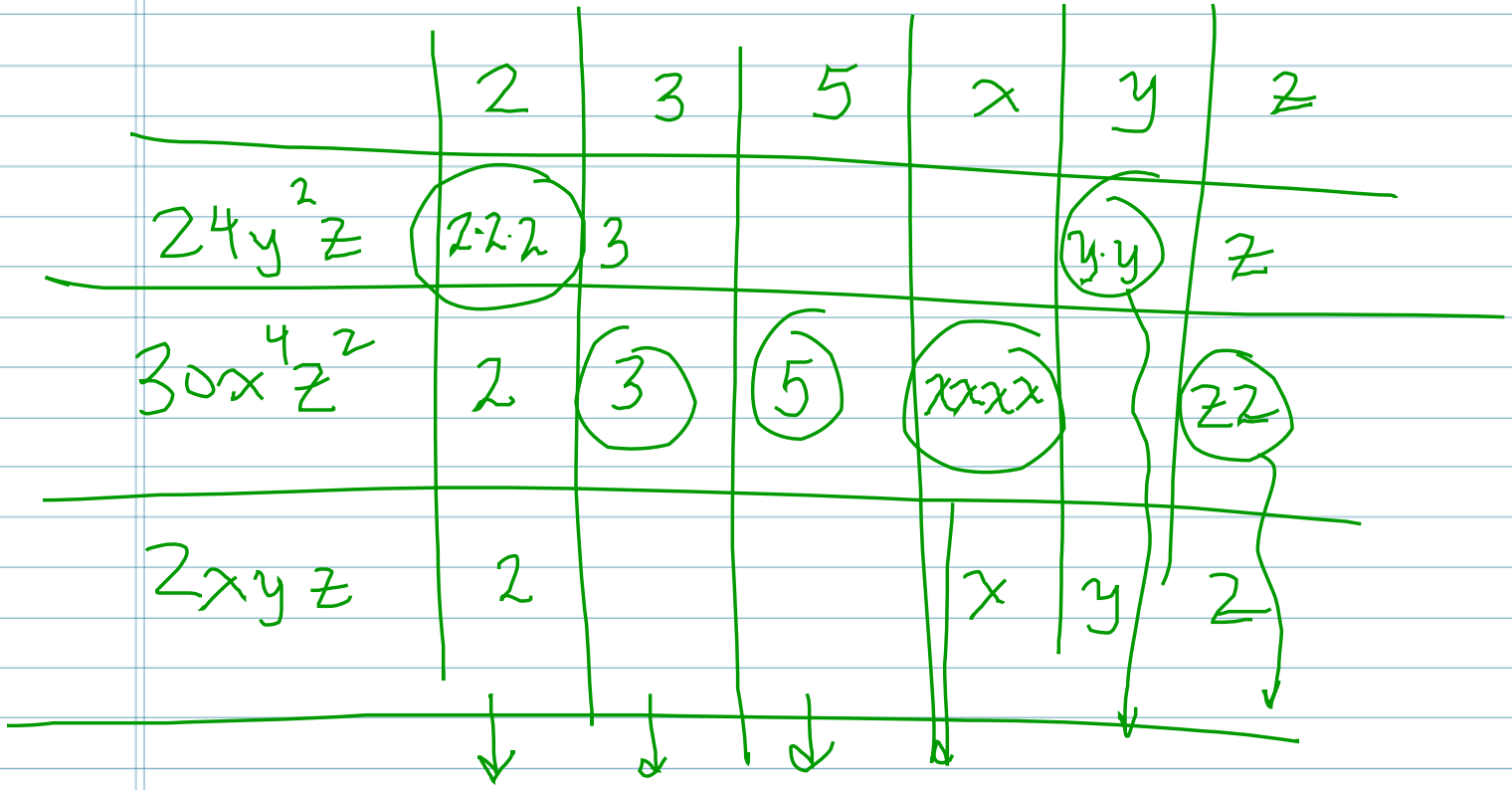
$12x^2y = 2 \cdot 2 \cdot 3 \cdot x \cdot x \cdot y$

	2	3	x	y
$4x$	$2 \cdot 2$		x	
$6y^2$	2	3		$y \cdot y$
$12x^2y$	$2 \cdot 2$	3	$x \cdot x$	y
	$2 \cdot 2$	3	$x \cdot x$	$y \cdot y$

$$\text{LCD} = 12x^2y^2$$

Method 3

$$\frac{5x}{24y^2z}, \quad \frac{7}{30x^4z^2}, \quad \frac{11}{2xyz}$$



$2 \cdot 2 \cdot 2 \quad 3 \quad 5 \quad x \cdot x \cdot x \cdot x \quad y \cdot y \cdot z \cdot z$

$$\text{LCD} = 120x^4y^2z^2$$

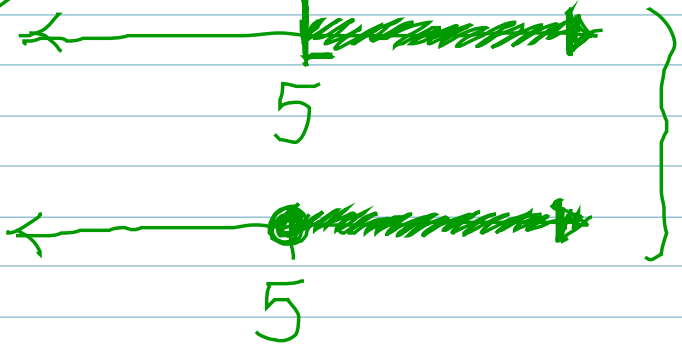
Learning Workbook p 141

include $\geq$ $\leq$ $=$ [ ] ●

exclude $<$ $>$ $\neq$ ( ) ○

∞ and $-\infty$ always get ( )

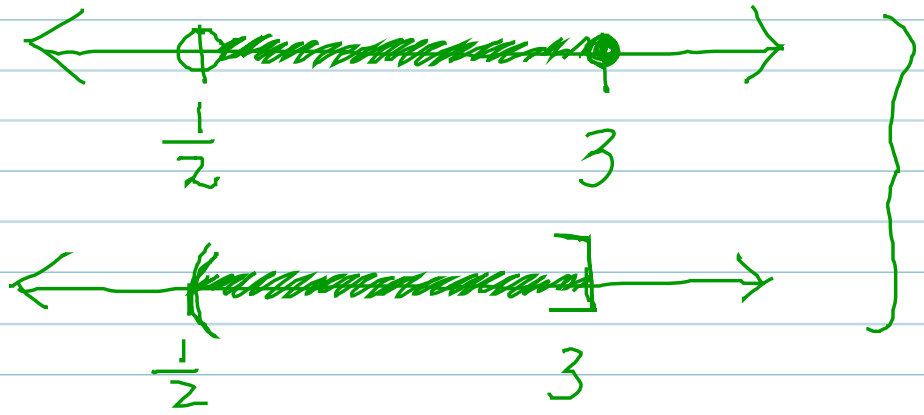
$x \geq 5$ inequality



number line

$[5, \infty)$ interval

$\{x \mid x \geq 5\}$ set



number line

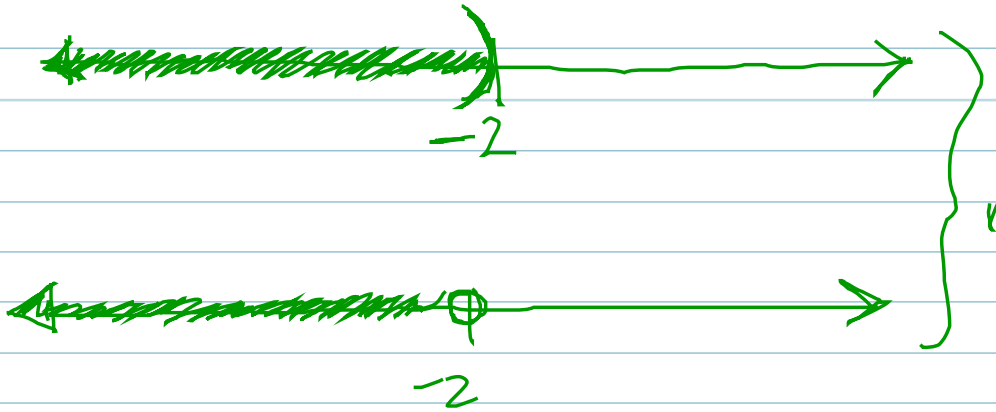
$\left(\frac{1}{2}, 3\right]$ interval

between $\frac{1}{2}$ and 3

$\frac{1}{2} < x \leq 3$ inequality

$\{x \mid \frac{1}{2} < x \leq 3\}$ set

$(-\infty, -2)$ interval



number line

$\{x \mid x < -2\}$ Set

inequality

$x < -2$ inequality

1. Simplify
2. Mult/Div
3. Add/Subt
4. Order of Ops
5. Equations

(1) Simplify

$$\frac{12x}{27x^2} = \frac{2 \cdot 2 \cdot \cancel{3} \cdot x}{3 \cdot 3 \cdot \cancel{3} \cdot \cancel{x}\, x} = \frac{4}{9x}$$

$$\frac{\overset{;3}{12x}}{\underset{3}{27x^2}} = \frac{4}{9x}$$

$$\frac{\overset{;5}{95y^2x}}{\underset{5}{10xy^5}} = \frac{19}{2y^3}$$

(2) Multiply / Divide

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}$$

$$\frac{2}{3} \cdot \frac{5}{7} = \frac{2 \cdot 5}{3 \cdot 7} = \frac{10}{21}$$

$$\frac{3}{10} \cdot \frac{50}{9} = \frac{\cancel{3}^{1} \cdot \cancel{50}^{5}}{\cancel{10}^{} \cdot \cancel{9}^{3}} = \frac{5}{3}$$

Divide

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c} = \frac{ad}{bc}$$

keep chg flip

$$\frac{2}{3} \div \frac{5}{7} = \frac{2}{3} \cdot \frac{7}{5} = \frac{2 \cdot 7}{3 \cdot 5} = \frac{14}{15}$$

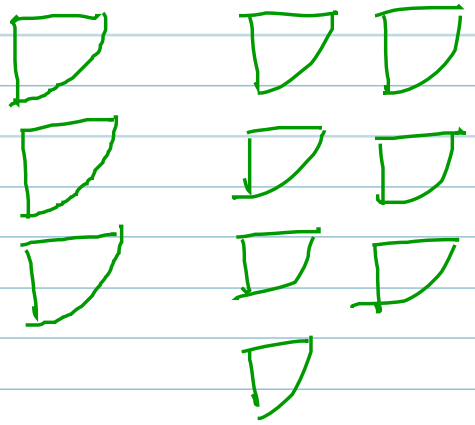
$$\frac{24x}{38y} \div \frac{12x^3}{19y} = \frac{\cancel{24}^{2}x}{\cancel{38}^{2}y} \cdot \frac{\cancel{19}^{1}y}{\cancel{12}^{1}x^3} = \frac{1}{x^2}$$

Numerator "how many"

denominator "what type"

Add/Subtract (likes)

$$\frac{3}{4} + \frac{7}{4} = \frac{10}{4} \overset{\div 2}{=} \frac{5}{2}$$



$$\frac{9}{13x} - \frac{7}{13x} = \frac{2}{13x}$$

Add/Subtract (unlikes)

$$\frac{4}{3} + \frac{4}{7}$$

$$\frac{4 \cdot 7}{3 \cdot 7} + \frac{4 \cdot 3}{7 \cdot 3}$$

$$\frac{28}{21} + \frac{12}{21}$$

$$\frac{40}{21}$$

$$\frac{y \cdot x \cdot 3 \cdot 9}{y \cdot x \cdot 3 \cdot 20x} - \frac{4 \cdot 4}{15x^2y \cdot 4}$$

$60x^2y$

$$\frac{27xy}{60x^2y} - \frac{16}{60x^2y}$$

$$\frac{27xy - 16}{60x^2y}$$

(4) Order of Ops

$$\frac{60}{7}\left(\frac{1 \cdot 2}{5 \cdot 2} - \frac{3}{10}\right)^2$$

$$\frac{60}{7}\left(\frac{2}{10} - \frac{3}{10}\right)^2$$

$$\frac{60}{7}\left(\frac{-1}{10}\right)^2$$

PEMDAS

$$\frac{60}{7} \cdot \left[\frac{-1}{10} \cdot \frac{-1}{10}\right]^{AS}$$

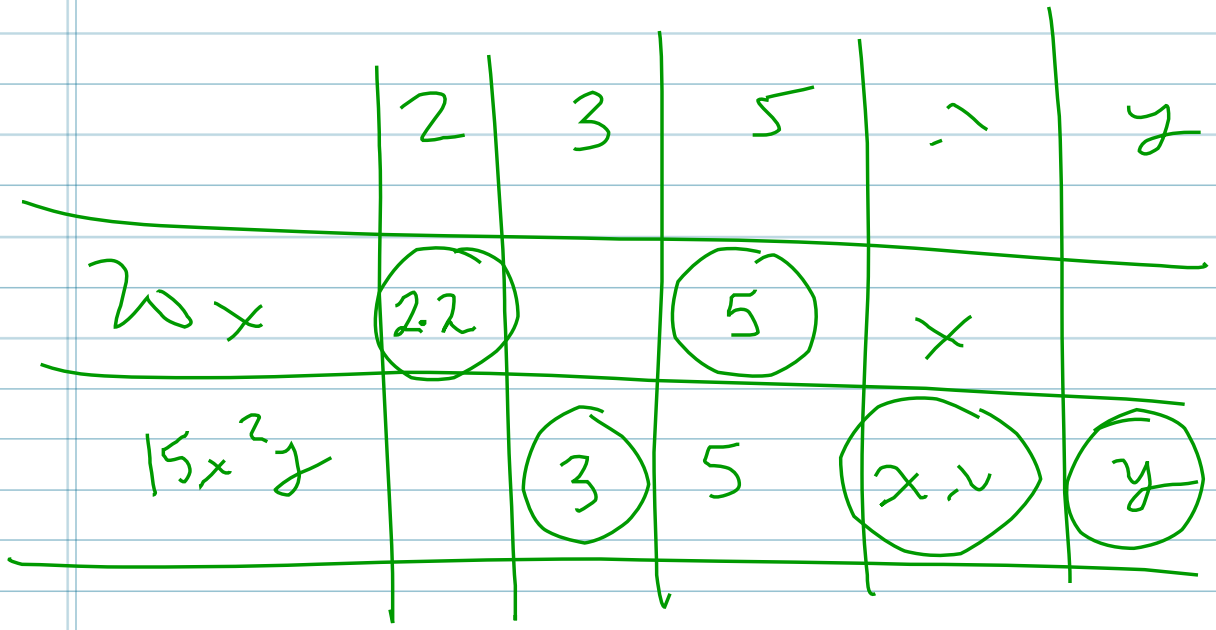
$$\frac{\cancel{60}^{3}}{7} \cdot \frac{1}{\cancel{100}_{10}}$$

$$\frac{3}{7} \cdot \frac{1}{5}$$

$$\frac{3}{35}$$

GCF MD AS

$20x$ and $15x^2y$



$2 \cdot 2 \cdot 3 \cdot 5 \cdot x \cdot x \cdot y$

$60x^2y$

$$\left(\frac{2x}{3}\right)^2 \div \left(\frac{x}{3}\right)^2$$

$$\left[\frac{2x}{3} \cdot \frac{2x}{3}\right] \div \left[\frac{x}{3} \cdot \frac{x}{3}\right]$$

$$\frac{4x^2}{9} \div \frac{x^2}{9}$$

$$\frac{4x^2}{9} \cdot \frac{9}{x^2}$$

$$\frac{4}{1}$$

(4)