Day 1

- Go over Sylabus
- Go over calander
  - Course entry quiz - 100%
    - first
  - Initial KC - locks every thing else out
  - C.A. pre assesment - in TC - 9-5 M-F
    - starts wednesday
    - due Aug 26
- Aleks is GB, ignore BB except attendance

Aside

Field Axioms

Group (a class on rubik's & uber, permutations; if a square, others; braiding strands)

0) $a+0=0+a=a$

1) $(a+b)+c=a+(b+c)$ associativity

2) for all $a\in F$, there is $-a$ s.t. $a+-a=0$ — ∃ of add. inv. ones

3) $a+b=b+c$ commutivity

4) $a\cdot b=b\cdot c$ " "

5) $(ab)c=a(bc)$ associativity of mult.

Note $a\cdot b=ab=a\times b$

ring ($\mathbb{Z}/24\mathbb{Z}$)

*6) $a(b+c)=ab+ac$ ~ distributive property

7) $a\cdot 1=1\cdot a=a$

integral domain ($F[x]$, $\mathbb{Z}$)

9) if $ab=0$ then either $a=0$ or $b=0$

Field ($\mathbb{Q}$, $\mathbb{R}$, $\mathbb{C}$, $\mathbb{R}(x)$)

10) for all $a\in F$, there is a^{-1} s.t. $aa^{-1}=1=a^{-1}a$.

Aside From an integral domain D we may create a field by looking at $\frac{a}{b}$, $a,b\in D$, with $\frac{a}{b}\cdot\frac{c}{d}=\frac{ac}{bd}$ and $\frac{a}{b}+\frac{c}{d}=\frac{ad+bc}{bd}$ then canceling common factors.

Aside Ex) $\mathbb{Z}\to\mathbb{Q}$, $\frac{6}{9}=\frac{2}{3}$, $\mathbb{R}[X]\to\mathbb{R}(X)$, $\frac{2x+4}{(x+2)}=2$

Order of operations

In USA

1. Parentheses / absolute value
2. exponents
3. multiplication
4. division
5. addition
6. subtraction

also we use infix,

Aside polish uses prefix

ex

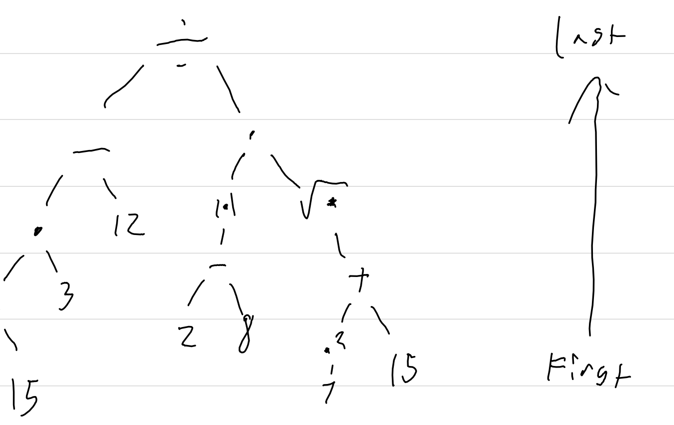
$\times + 3\ 2\ 4$

$=(3+2)\times 4$

ex order ops) uses ops we will cover later

$$\frac{(7+15)\cdot 3-12}{|2-8|\cdot\sqrt{7^2+15}}$$

How I See this



- if Time switch to Exponents — Review worksheet
  - make chartturn filled as go along

Al 1 Basics

wk 1 wednesday

Ann - TC opens Thursday

Content: - Mid 1.2, thru 1.3
Exponents + Factoring

- do 1.2, then have together work through BB sheet
if time, move to 1.3

Review / preview:

- Alg expr w/o neg exponent -70% rem
  - $-3m^{-5} = \frac{-3}{m^5}$

- 1.1 eqn -70%
  - $|4w+6| = 2$

$4w+6=2$	$4w+6=-2$
$4w=-4$	$4w=-8$
$w=-1$	$w=-2$

- Translating sentences into eqn's -57%
  - Three more than the quotient of a number and 4 is equal to 7.

- exponents multiplication -43%
  - $2y^5u^7 \cdot 8u^5 \cdot 2y$

wk 1 Friday

Flow: Generally wiki on Friday, starting in module 3 through.

Sodns: - Quiz 1 due Sunday - requires { hw ≥ 90% / course content quiz + I.K.C.
- C.A. preassessment due 26th - in TC,

Ann: on BB, Check out Note repository, its where I'll post notes,

(P) Review:

① 1-1 eqn type 2 — 74% rem

$|2w+4| = 10$

② Sent → eqn — 61%

Six more than the product of a number and 8 becomes 9.

③ Simplify alg. expr'n — 38, 45, 45 %

$$\frac{45x^{-7}x^{5}}{(y^{-3}x^{4})^{-2}\cdot 5^{2}}$$

④ Intro to 1-1 eqn — 45 %

$-|v| = -8$

Content: Finish 1.2, do 1.3

Wk 2 Monday

Due: C.A. Preassessment - in TC, today 9-6

Later: oct 7th last day to register to vote

Content 2.1 linear

(P)Review: ① Solve $-3|4x+2| = -6x+3$ 45% mean

$|4x+2| = 2x-1$ Note $2x-1 \geq 0$ for inequality sense

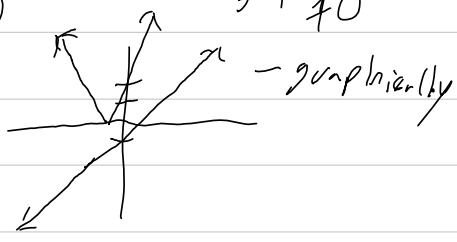
$4x+2 = -2x+1$ $\quad$ $4x+2 = 2x-1$

$6x = -1$ $\quad$ $2x = -3$

$x = -1/6$ $\quad$ $x = -3/2$

check: $-\frac{2}{6} - 1 \neq 0$ $\quad$ $-3-1 \neq 0$

No soln



- graphically

② Line through $(-2,-3)$ slope $-5/2$

$y-(-3) = -5/2(x-(-2))$

③ // and $\perp$ to $y = -\frac{2}{7}x+1$ through $(-8,3)$

$m_0 = -2/7$ $\quad$ prop: $m_0 m_\perp = -1 \rightarrow m_\perp = \frac{-1}{m_0}$

$m_{//} = -2/7$ $\quad$ $m_\perp = 7/2$

//) $y-3 = -\frac{2}{7}(x+8)$

$\perp$) $y-3 = 7/2(x+8)$

④ Line through $(-1,2)$ and $(-4,7)$

$m = \frac{\Delta y}{\Delta x} = \frac{2-7}{-1+4} = \frac{7-2}{-4+1} = \frac{-5}{3}$

$y-2 = -5/3(x+1)$

Goto: BB 1.36 Set = to 0 and explain answers, L2.d1a L2.d1b L2.d2 BB

Week 2 wed 1

Ann T1 Sept $3^{nd} + 4^{th}$

(P)reveiw: ① $-|2x+7|-5=-5$ 44% rem

② // and ⊥ to line 90% rem

$9x+2y=-9$ // and ⊥ lines through (-1,-4)

m_0: examine $Ax+By=C$

$By=-Ax+C$

$y=\frac{-A}{B}x+\frac{C}{B}$

So $m_0=\frac{-A}{B}$.

Here, $m_0=-\frac{9}{2}$

//-line ($m_{\parallel}=m_0$): $y+4=-\frac{9}{2}(x+1)$

⊥-line ($m_{\perp}=\frac{-1}{m_0}$): $m_{\perp}=-1/(-9/2)=2/9$

$y+4=2/9(x+1)$

③ pt slope 88% rem

line through (-4,-8) w/ slope 5/4

$y+8=5/4(x+4)$

(annotations: neg → negate; 5/4 as is)

④ are L_1: $3x+2y=6$ 83%

and L_2: $2x-3y=7$

//, ⊥ or askew?

Recal $m=\frac{-A}{B}$ for ~~when~~ $Ax+By=C$

$m_{L_1}=-3/2$

$m_{L_2}=-2/-3=2/3$

Note $m_{L_1}\neq m_{L_2}$ - not //

$m_{L_1}\cdot m_{L_2}=-\frac{3}{2}\cdot\frac{2}{3}=-1$

hence ⊥.

⑤ Find x,y intercepts for

$y^2-x-4=0$

Def: - x-intercepts are points on curve intersecting $y=0$. IE $2^{nd}_{(y)}$ coord is 0.

- y-int is when $1^{st}_{(x)}$ coord is 0.

for ex: x-int: set $y=0$

$0^2-x-4=0$

$x=-4$

So is point (-4,0) - Deviation from Aleks, there, just -4.

y-int: set $x=0$

$y^2-0-4=0$

$y^2=4$ $\wedge^2$ kills sign, to undo need ±

$y=\pm 2$

y-ints: (0,-2), (0,2)

Aleks: -2, 2

6) eqn of line through 2 pts 80% rem

Line through (-2/5, 8/3) and (1/3, 6/5)

$m=\frac{\Delta y}{\Delta x}=\frac{8/3-6/5}{-2/5-1/3}=\frac{3\cdot5}{3\cdot5}\cdot\frac{(8/3-6/5)}{(-2/5-1/3)}=\frac{8\cdot5-6\cdot3}{-2\cdot3-5}$

$=\frac{40-18}{-6-5}=\frac{22}{-11}=-2$

Line: $y-6/5=-2(x-1/3)$

Content: 2.2 Intercepts

1. goto 2.16 - lines, work #4 #5 (L2.d16)

2. goto 2.2 - intercepts (L2.d2)
   - Groups of 4, half does x, other does y, race to hold up ans.
   - at end do $x+2y+3z=4$ ← eqn of a plane

   find x, y, z-intercepts.

Recall: intercepts are when it hits the axis, ie when all other vars are zero.

x-int: $x+0+0=4$

(4,0,0)

y-int: $0+2y+0=4$

(0, 2, 0)

z-int: $0+0+3z=4$

(0, 0, 4/3)

If finish, Aleks time