Ready

STENOGRAPHER

NOTE-BOOK

BOOK NO. FROM TO No. SG-80

October 1939 (Sunday)

SOCIAL-ACTIVITY THRU. CITY

AROUND THE NIGHT SPOTS

[illegible] week end this was [illegible] as if [illegible] wanted to make up for lost time. Everyone was out.

All the fellows took their best girls to a good time. There was much dancing and [illegible]

The favorite night spot is week end was the Old Mill Inn. [illegible] for the younger set.

The Barn was [illegible] on Saturday night. [illegible] sports were there.

SUNDAY PARADE

Every Sunday afternoon all the people in town who stroll through Stanover park, to see what the other fellows are doing.

All up and down Broadway fellows and girls could be seen, some gather in groups on corners and just walking around.

The usual Sunday afternoon day football game was played with [illegible] — as [illegible]

Oct. 11, 1939 (Wednesday)

WAR NEWS

Edinburgh Bombed

It looks as if the second World war is under way yesterday, German airplanes tried to bomb a certain bridge in Scotland. The airmen attempt met about transport ships said for the raid were not against the town, Edinburgh, but the bridge.

Anti-aircraft guns and British planes came to rid the skies of the German invaders.

One German pilot narrowly missed the clattering hand of Mr. Hearn. A British plane forced him down at last. He had to fly under the span of the bridge. As he zoomed down below the bridge, the German machine gunned as helpless troop train going over the bridge.

Churchill rolled over in his grave at the bombing of his native city.

Oct. 18, 1939 (Wednesday)

HAPPENINGS AT ST XAVIER

SENIOR CLASS OF 40'

Have you noticed that the senior class at St. X. is dead. I mean they are dead in social activity. Oh! a few are alive, but the majority are a bunch of dead heads.

I haven't even heard a word about a dance being held by any clubs of the school.

Last year's class, as really as senior classes should, they really opened the tantalizing old X. wonderful.

Come on fellows put some life in you and start the old spirit.

A FEW ARE DOING SOMETHING ABOUT IT

A few seniors under the leadership of Jerry Stedman, are trying to liven things up around old X.

I could count on my fingers the seniors who really carry out the real spirit.

What they to do is follow the leadership of Jerry and his men.

Oct 19, 1939 (Thursday)

LATEST DOPE

TWO BIG GAMES

This week end will go down in the history of Louisville.

The will a hot time in the old town.

Friday night U of L plays St. Joe's and I picking my money on St. Joe.

Saturday W of K meets the University of Georgia. W of K will take this game easily.

St. Xavier meets Knoxville Friday night and I'm for dear old X.

FAIR

BIG DOINGS

Next Saturday two colleges in town you may expect anything to happen.

Friday night the towns will be packed with people.

Friday night the U of L game and every body will be on hand no doubt.

Louisville will have Saturday it has had a collegiate week end.

FAIR

Monday (Oct. 23, 1939)

SPORTS NEWS

ST. XAVIER BEATEN

Well, this time, you dance on until for the splendid game Friday nite. St. Xavier at last showed some real speed.

The team now on entry in the fourth game of the standing X. They fought hard and didn't give up until the final gun.

Even though we lost by a score of 6 to 0, we have not played our finest game.

Keep up the cheer and the team will be up to snuff again.

W of K Beats Georgia

The wild cats had little to smilin Saturday and crowed the good ol' Southern gentlemen twice.

Jr. Jones made a sensational catch of a pass and dashed 50 yards for a touchdown.

Final score

W of K 13 Georgia 6

U of L Beats St. Joe

U of L beat the Cats fiercely on Thursday night.

Louisville went into all comers and take week end

Tuesday (Oct. 24, 1939)

PEP RALLY HELD FOR GIRLS

GIRLS INVADED XAVIER

Today, for the first time, the beauties of Immaculate invaded the campus of St X.

The girls made a lot of noise in the vicinity of chem. If the lassies ever had any thing to fight for, this is it.

All the Catholic High School for girls had some sort of representation.

I bet Brennan heard the cheers of the lassies and grew green with envy.

BILL FLEECE TAKES LIMELIGHT AGAIN

Say fellows you didn't know we have a cow in our school.

Bill, our head cheer leader moved them again, herding us as a herd.

BRO. RUDLOFF MAKES SPEECH

Bro. was forced to make a speech by the members of H.C. Chis.

It will go down in history of the school for him I think we ought to make a pep talk at all the rallys.

Wednesday (Oct 25, 1939)

JITTER BUG REVIEW

BEST BANDS

Ray Noble ended his session of swing in Calif. and heads for old New York.

Benny Goodman, the king of swing, successfully bit Tommy in the way of getting in the grove.

I think the best swing band is Glen Gray and his chimes. He can really beat it out.

Jimmy Saint is one of the best and so is Tommy Dorsey.

LATEST DANCE RAGE

The newest dance is the Deckwand. Every where you go, young couples are doing it.

All you have to do is click your feet and put some life in it.

Its the way to dance by is "Wheaw."

I think Hitler wasn't an Irish and a by-ent, not would be fierce.

So jitter around all you big cats and get in the grove.

Thursday (Oct 26, 1939)

SHOWS IN REVIEW

CAGNEY IN NEW HOODLUM PICTURE

James Cagney stars again in a new gangster picture. He plays the part of an ex-soldier who takes up racketeering for easy money.

The picture should be a thriller for young and old.

Cagney has been elected as the best actor for gangster roles.

ANOTHER WAR PICTURE

War propaganda, I hope, will not enter our motion pictures.

The war times are over but our movie pictures show days. Hence, war is the main topic of the day.

We may learn from these pictures the real horrors of the war.

The new picture is "Juarez." Edith Cavell.

BELL OVROS

TVBELL OVRCE ISPCED

THIS DAG BE NIEM

Friday (Oct 27, 1939)

ST X VS MANUAL

Tigers MEETS GOAT

The Tigers of St X meets the Bulldogs of Manual tomorrow afternoon on the gridiron.

A good game is expected by all and it will be a fast one.

Some say Manual will win but I think the Tigers have something up their sleeves and will come out on top.

"I wistfully
"Out of the night that covers me,
Black as the Pit from pole to pole,
I thank whatever gods may be,
For my unconquerable soul."

By Henley
from Literature and Life

ST. X IS BEHIND THE TEAM

The students of X are really behind the team now. They want to beat their arch rivals real bad.

The girls are behind the team too.

So come on fellows let's really show the bulldogs they aren't so hot.

FAIR

FAIR

Monday Oct 30

SOCIAL HIGHLIGHTS

DAHL'S PLACE OF THE WEEK

Dahl's on Saturday night is the best place in town. It's one of my favorite ones.

Frances gives the place. It has a small dance floor but which is just it is the topic.

If you want to have some fun and see on your birthday go to Dahl's.

SUNDAY IN THE PARK

Sunday was a swell day for walking in the park and everyone took advantage of it.

Lots of X'ers were there including myself.

The usual gang play football and Jerry Jirland (an ex X'er now) was the star backfield man.

Tuesday (Oct 31, 1939)

SPOOKS

THE GHOST GOES WEST

Tuesday night it seems as if everyone was in the Westend at some party.

The kids played their pranks and we got caught.

Parties were going on in every part of town. I visited several gatherings.

Most of the Kilund gang was down in the Westend too.

THE BARN WAS FILLED

The old Barn (a dancing place) was filled with all the jitterbugs of the town.

A few had on costumes but not many. Most very big had lots of fun.

Sherd & X were not there this their last flames.

Wednesday Nov. 1. 1939

NO SCHOOL

STX. BOYS ALL IN TOWN.

Today was a holiday and no school for us. I went up town to join the crowd up there.

Too great. Almost St X men were scattered all up town. They were mostly first base men. Stovall and all the vets were there.

Any holiday you want to meet the crowd go up to St.

WHAT A RELIEF

Oh! boy what a relief no school today. That old grind is off until another day.

Slept late oh! yes I got very boring about 11:00 and I decide to do something about it.

I hitchhiked up town and took a look at school. Yes the shift was there and then I felt all right.

Thursday Nov 2. 1939

STUDY CLUB AT ST. X

One of the best Clubs of St X again is the study Club. At 1 lunch we were brewing of how to combat the enemies of our religion.

The project the Study Club is on now is Communism and how to fight it.

I am very interested in it and interested to see it through.

THE ART OF CATCHING A FREE RIDE

You didn't know there is an art to hitchhiking. Whenever I want to go up town I don't use the old thumb.

The best way is to always dress neat and show a big smile and yes to this you'll get picked up.

The best time of thumb is at night time.

Friday Nov 3 1939

LATEST DOPE

X MEETS ASHLAND

Bengal Tigers 27 Coach Graham meets Pete Ashland team coached by Grant brothers. This is to be a family fight. Brothers against brothers. The Tigers have a slight edge over Ashland.

Well boys, you have to fight for the Coach for we want to see him win.

Strong Son of God immortal love
whom we stand not seen
thy face
By faith and faith alone
embrace
Believing where we
cannot prove:

Jesus Lo Memorium

(Monday) Nov. 6 1939

Hit Parade

Scatter Brains, I think is the best song of the week or the week Glen Miller and Frank Weatherly's boy the best arrangement of it. The newest thing out is a little duet called Urbana. Glen Miller takes all honors on this new song.

His girl singer and glee Club are fine. They sing Urbana. Really cut the jive on the mellow side.

SOINTS ROUND UP

This town of the week is Ybalo. All the men of X meet there after the game.

Saturday night, Mac, Summers, Engler, Conway, and many more were there. I think it is about the best place out in town.

So if you want to see the gang, go to Ybalo any Saturday night.

Nov. 7, 1939 Tuesday

Election Day in Louisville

POLLS AT 684 SUMMIT
(MY HOUSE)

Today, Tuesday was a street of the sound of hammering and hard talking. It was election day. People were tacking up signs disturbing my relax.

People began to rushing into the vote and hurrying out to work.

The workers were running in and out the house to get warm.

KEEN JOHNSON

Johnson has this election in the bag. He is no far out in front now, I think, they out to city counting.

Allen was Jacob. Graves and now we new new Governor.

Well, he's hoping he is the best man. and makes the a letter state to his in

Nov. 8, 1939 (Wednesday)

WAR NEWS

ATTEMPT TO KILL HITLER

Today in Munich, Hitler made a speech in a Beer Hall. 23 years after his attempted Dictatorship.

The Jews left the meeting a little before he was supposed to leave. This was then likely saved his life.

A explosion took the Beer hall killing 6 and wounding 60. It was an attempted assassination on the Nazi leader's life.

WAR NEWS

HITLER SAYS
HE'LL FIGHT WITH
EVERY MEANS

HITLER today stated he would fight with every means. (And) include such things as bombing cities and use submarine warfare. He also announced Germany was prepared for a 5 years war.

It looks as if the horrors of war is about to turn loose.

(Thursday) Nov. 9 1939

BING CROSBY

Tonight Mr Crosby had a real fine show of the air. His singing is top and I'm my guess he can't be beaten by anyone.

Chester Morris of the movies was his guest star. He made a fine radio actor he and Bing.

It was an all around good program.

BORDER CLASH

Well it looks as if Hitler is up to his old tricks again. German soldiers killed a Polish citizen and kidnapped two more into Germany.

This looks like poland. Does it mean another war with the Poles or what.

Friday Nov 10

STX MEETS MALE

Here is an poem picked for our team

Tiger tiger burning bright
Are the feet of this night
What immortal hand or eye
Could frame thy fearful symmetry

In what distant deeps or skies
Burned the fire of thine eyes?
On wings dare he aspire
What the hand dare sieze
the fire.

LET W IN

Come on team push over a touchdown for old X. We are behind you and will yell our head off.

Go out on the field and show the bulldog back home.

FAIR

FAIR

Monday (Nov. 13, 1939)

SOCIAL ACTIVITY

Did her prints were curled to the gills last night to Dabey Crum and the Prom.

Canary had a date with his lamp again. His two stooges had dates too.

Every place Canary you seemed to find his two stooges. They are like baby guards only they don't guard.

TWO FOOL SMASH A SHIP

Yesterday two fools crashed a airplane in a corn field. It was an air show on Ash Pollum road.

One fellow jump in a chute. And pulled up a handkerchief and the wind blew this way and we don't know. It was a good show for two bits.

Tuesday (Nov. 14, 1939)

NEWS OF ST. X. HIGH SCHOOL

MORE PEP

Well at last the Senior Class has been up. The boys have gotten into the suit into the game.

You can see the suit any night at Dabbs with their sugars on their arms.

The whole school has changed. Why? Why are we trying to sell chances on the turkeys.

SELL MORE

Come on fellows sell more chances. You know that is what is build a new field house. So this is a good cause. Get in and sell some chances for show the kid you are really boy out to help.

Wednesday (Nov. 13, 1929)

LATEST DOPE

4C GETS HOLIDAY

Well old 4C got off a day from School. Their quota was 117 and they took in 119. Wasn't that swell hoping towards fellows old Xi found of you.

4th ST. GANG

Every day the gang in front of St. gets bigger and bigger. Pretty soon people won't be able to go downtown to shop. The hill has taking over town into a bay

Monday (Nov. 22, 1929)

SOCIAL ACTIVITY

SAT. NITE

Saturday night the social activity was very much on its toes.

The Barn was very crowded Sat. and few St. X. kids were scattered about.

Stubb was full of St. X men. Officers and all the football players were there.

Canary and his two stooges had a flat tire and got their clothes home late. Was their face red.

SUNDAY NITE

Sunday was a bit on the dreary side. Most everyone went to the show.

Everyone went to see Dancing Co-eds with Archie Shaw's band.

Curly and his girl was out at Hupp's doing the latest steps.

Canary was out with his friend again.

Tuesday (Nov 21, 1939)

LATEST DOPE

4th ST. CROWDED

Fourth Street was crowded again after school today.

Jack Berry was at the usual place. The music shops were full of dupes again. It's a wonder they don't throw these bums out.

The rain still doesn't seem to keep the kids off of the street.

BIG PARADE

The old town may expect a big parade Friday night. The St. X gang won't take part by taking cars or the big balloon.

It will be the first time a bunch of boys or girls take hold of a balloon. They usually pulled them up.

Wednesday (Nov. 22, 1939)

CANARY LIVES UP TO NAME

Canary lived up to his name by finally last night in a friendly little card game.

The stakes were very high and the game broke up in an hour.

Lucky lost his two strongest with his own cards and when he deals.

The total sum of his winning was the large amount of 1¢

Fair!

A LAMENT

O world! O life! O time!
On whose steps I climb
Trembling at that where I
had stood before,
When will return the glory
of your prime
No more — oh never more!

Out of darkness and night
a joy has taken flight.
Fair spring, and summer
and winter hours,
Yield my faint heart,
with grief but with delight
No more, oh never more.

From Heaven and Life

Boy Wanted

Any novel by Dudley Clarence Hardy

Jan. 1 3 act play - Monday
Name of play
Author of play
Description & sketch of main characters
Program of play
Epitome of a pretty appearing
Scene
Critique of play

Scrap Book for 12 also Short story
Jan 15 monday 411 to 500 by magazine of
matter

(1) Examine the foundation of the projection on a square plane

(2) Save they work on ⊙ circle

Solid Osian Formula

$d = 2\sqrt{2}$

$2a^2 + e^2 = 3e^2$

$S_c = 4e^2$

$S = d(4e) = 4e^2$

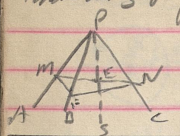
$T = 6e^2$

$d^2 = a^2 + b^2 + c^2$

$S = 4P$

$T = S + 2B$

The sum of any 2 face ∠s of a ∆ taken together is greater than the 3rd face ∠



Given: Trihedral ∠ P with the faces ∠s APB, BPC, APC.

To prove: ∠APB + BPC > APC

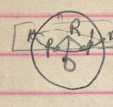
PROOF

I Thru P in PA draw PS making ∠APS = ∠APD	I Thru a given pt. on a given line only one line may be drawn making an ∠ = to a given ∠
II Thru E any pt on PS draw bis MN	II 2 pts determine a line
III On PD make PF = PE	III Pts in a line determined or located
IV Then MN and F are in a plane	IV A straight line and a pt. outside determine a plane
V Join MF and FN and E joined	V Intersection of 2 planes is a st. line
VI In the ∆s PMF & PME ∠MPE = MPF + PF = PE	VI Construction
VII Also PM = PM	VII Identity
VIII ∆ PMF ≅ PME	VIII S.A.S
IX MF = ME	IX Corresponding parts of ≅ ∆s are ≅
X In the ∆ MFN MF + FN > MN or ME + EN	X Pts in a straight line determine the shortest dist. between 2 pts.

XI Sub II from X FN > EN	XI = s added to unequals, the results are unequals in the same order
XII In the ∆s PEN & PFN FN > EN & PE = PF	XII Already proved
XIII Also PN = PN	XIII Identity
XIV ∠FPN > ∠EPN	XIV If 2 sides of one ∆ are = to 2 sides of another and the 3rd side of the 1st is > than the 3rd side of the 2nd, then the ∠ opp the 3rd side of the 1st is > the ∠ opp the 3rd side of the 2nd
XV But ∠MPF = ∠MPE	XV Construction
∴ Adding XIV to XV ∠MPF + ∠FPN > ∠MPE + ∠EPN	XVI If = s added to unequals the results are unequals in the same order
XVII But ∠MPE + ∠EPN = APC	XVII Whole = to the sum of all parts
XVIII ∠ MPF + ∠FPN > APC	Sub.

Q.E.D.

If a plane passed through a circle right, then intersects a circle



Given Sphere O with diameter line joint of O

I Drop ⊥ AB

I From a given exterior point only ⊥ can be drawn to a given point

II Select any 2 pts on the intersection and connect them to O and R

II 2 pts determine a straight line

III OR ⊥ PR & P'R

III A line ⊥ to a plane is ⊥ to every line in the plane passing through its foot

IV ∠s ORP, ORP' are rt ∠s

IV ⊥s form rt ∠s

V PO = P'O

V radii of the same sphere are =

VI RO = RO

VI Identity

VII rt △ PRO ≅ △ P'RO

VII

VIII PR = P'R

VIII Corresponding parts of ≅ △s are =

IX Since any 2 pts equidistant from R

IX A circle is a closed curve all pts equidistant from the center

P, P' = ⊥'s to a circle

Sphere with ∠s are ∠s formed intersection of 2 great

(5)

Company say

Butcher who packs wife need grinder gets little behind in business

Hotel not last they in world must to last they lucks in chew bad, scan in bad good

Page impossible, get wife chew up man faster than man gents down

Seven days honeymoon make one hole week

Man who lick dirty tit make clean hand yit

If a felt manufacturer gets his felt takes a week; a leather dealer gets his hide every hundred an ice man gets fourth price every morning; a table cloth gets jolted up 3 times in day; a street car conductor will take on a lady for 10¢. The cross has to go in stenographers drawer to get lead for his pencil; a mechanic has to screw tightener on the desk a dentist gets his tool in a woman's mouth for 50¢, then when in the hell should a dam doctor charge $3.00 for coming once

(1)

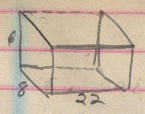
$T = SA + B$

$T = 2ab + ep$

$T = 2(22 \cdot 8) + 6(8 \cdot 10)$

$T = 2(176) + 6(80)$

$T = 712$ sq in.



(2) I $KA = \frac{ab}{2}$

$KA = \frac{6 \cdot 8}{2}$

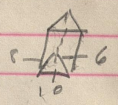
$KA = \frac{48}{2}$

$KA = 24$ sq in

II $V = Bh$

$V = 24 \cdot 14$

$V = 336$ cu in



(3) I $KA = \frac{s^2\sqrt{3}}{4}$

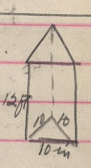
$KA = \frac{100\sqrt{3}}{4}$

$KA = 25\sqrt{3}$ sq in

II $V = Bh$

$V = 25\sqrt{3} \cdot 144$

$V = 3600\sqrt{3}$ cu in



(4) I $c^2 = a^2 + b^2$

$100 = 36 + b^2$

$64 = b^2$

II $K[B] = \frac{ab}{2}$

$K = \frac{12 \cdot 16}{2}$

$K = 96$ sq in

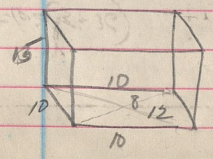
III $T = SA + 2B$

$T = 12(40) + 2(96)$

$T = 792$ sq in

IV $V = Bh$

$V = 1440$ sq in



(5) I $V = Bh$

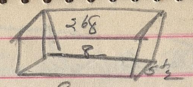
$268 = 44h$

$h = 6$ ft

II $T = SA + B$

$T = 6(27) + 44$

$T = 200$ sq ft



(6) I $V = lwh$

$105 = 5.35h$

$105 = 17.5h$

6 ft $= h$

II $S = ep$

$S = 6 \cdot 2(5 + 3.5)$

$S = 6 \cdot 17$

$S = 102$ sq ft

III $B = wh$

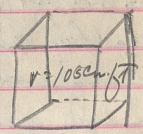
$B = 5.3.5$

$B = 17.5$ sq ft

IV $T = SA$

$T = 102 + 17.5$

$T = 119.5$ sq ft



(7) $df = e\sqrt{2}$

$\sqrt{7} = e\sqrt{2}$

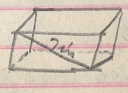
$e = \frac{\sqrt{7}}{\sqrt{2}}$

$e = \frac{\sqrt{14}}{2}$ in

II $Ve = e^3$

$Ve = \frac{14\sqrt{14}}{8}$

$Ve = \frac{7\sqrt{14}}{4}$ cu in



(8) $df = e\sqrt{2}$

$\sqrt{7} = e\sqrt{2}$

$e = \frac{\sqrt{7}}{\sqrt{2}}$

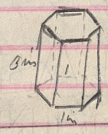
$e = \frac{\sqrt{14}}{2}$ in

II $Ve = e^3$

$Ve = \left(\frac{\sqrt{14}}{2}\right)^3$

$Ve = \frac{14\sqrt{14}}{8}$

$Ve = \frac{7\sqrt{14}}{4}$ cu in



(9) $B = 6\left(\frac{s^2\sqrt{3}}{4}\right)$

$B = 6\left(\frac{5^2\sqrt{3}}{4}\right)$

$B = \frac{6 \cdot 25\sqrt{3}}{4}$

$B = \frac{75\sqrt{3}}{2}$ sq in

II $V = Bh$

$V = 5\left(\frac{75\sqrt{3}}{2}\right)$

$V = \frac{375\sqrt{3}}{2}$ cu in

(10) I $V = Bh$

$V = 6 \times 4 \cdot 3$

Small $V = 72$ cu ft

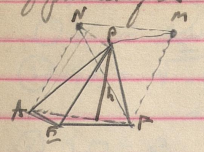
II $V = Bh$

entire $V = 6\frac{1}{2} \times 4\frac{1}{2} \times 3\frac{1}{2}$

entire $V = 73.96$ cu ft

OK-RR

The volume of a triangular pyramid is = to $\frac{1}{3}$ of product of the base and the altitude



Given: Δ angular pyr. P-AEF
base = alt. = h

To Prove: $V = \frac{Bh}{3}$

I Thru A draw AN ∥ EF = PE and F " FM ∥ EF = PE	I Thru a given pt. just one line can be drawn ∥ to a given line & equal thus can be repeated as limited
II Pass a plane N, P and M	II 3 pts not in plane determine a plane
III Lines PN, PM and MN are formed	III Intersection of 2 planes is a st. line
IV PA, FE and (N F) are [P]	IV If 2 sides of a quadrilat are = and ∥ then it is a [P]
V ∴ PN ∥ AF, PM ∥ EF	V Opposite sides of a [P] are ∥ & =
VI ∴ plane NPM ∥ AEF	VI If two intersecting lines are ∥ to 2 intersecting lines in another plane then the planes are ∥
VII ∴ NAEP is a prism	VII a prism = polyhedron whose lateral faces are [P] and whose bases are ∥ planes
VIII Pass planes thru E, N and F	VIII 2 intersecting lines determine a plane
IX ∴ FN is formed	IX Intersection is a st. line
X Lateral faces of P-MNF and P-NMF △ MNP ≅ FMN	X The diagonal of [P] bisects it
XI Both pyramids have same altitude	XI From a given ext. point only 1 ⊥ can be drawn to a given plane.

XII ∴ P-ANF ≅ P-NMF	XII two triangles pyramids with equal bases and equal altitudes are equivalent
XIII Both pyramids P-AEF and P-PNM △ APF ≅ △ PNM	XIII The bases of a prism are ≅ polygons.
XIV Both has h is altitude of both pyramids	XIV ∥ planes are everywhere equidistance
XV ∴ P-AEF = F-PNM	XV Reason (XIV)
XVI P-AEF = P-MNF or P-ANF	XVI Things = to the same thing are = to each other
XVII Proved P-AEF + P-NME + P-AMF = NAEF	XVIII The whole is = to the sum of all its parts.
XVIII But prism N-AEF = Bh	XVIII prism N is = to B x h
XIX 3 P-AEF = N-AEF	XIX Substitution
XX ∴ 3 P-AEF = Bh	XX Things = to same thing are = to each other
XXI P-AEF = $\frac{Bh}{3}$	XXI 3s divide by 3 ∴ the result are =

Q.E.D.

Plane figures

K = area of plane fig

(1) $K\Delta = \frac{ah}{2}$

(2) $K\Delta = \sqrt{s(s-a)(s-b)(s-c)}$

s = semiperimeter

(3) $K\square = s^2$

(4) $K\square = ab$

(5) $K\square = \frac{a(b+c)}{2}$

(6) $\frac{\text{circ}}{2\pi R} = \frac{\text{cent}\angle}{360}$ length of arc

(7) $K\odot = \pi r^2$

(8) K reg. polygon $= \frac{ap}{2}$

a = apothem = radius circle

p = perimeter

(9) $K\Delta = \frac{\text{cent}\angle\ \pi R^2}{360}$ $\frac{\text{area}\ K\Delta}{K\odot} = \frac{\text{cent}\angle}{360}$ area of circle

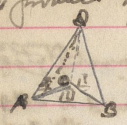
(10) $c^2 = a^2 + b^2 - 2ab\cos\angle$ opp Δ

(11) In rt isosceles Δ a or b $= \frac{c\sqrt{2}}{2}$

(12) In $30°, 60°, 90°$ $s_{30°} = \frac{c}{2}$

(13) $s_{60°} = \frac{c\sqrt{3}}{2}$ $K\Delta = \frac{s^2\sqrt{3}}{4}$

The lateral area of the pyramid



area of a regular pyramid is half of the slant height and the perimeter of the base

Given reg. pyramid D-ABC the lat. area is $\frac{1}{2}$ slant height of the base

Proof: $L = \frac{1}{2}lP$

I l = slant height of I, II, III

I Rectangular faces of a reg. pyr. are $\cong$

II $K\Delta$ I $= AD$
$K\Delta$ II $= DB$
$K\Delta$ III $= DB$

II $K\Delta = \frac{al}{2}$

III Lat K I + K II + K III $= S$

III Lateral area of a reg. pyr. = the sum of the lateral faces

IV K I + K II + K III = (AD + DB + AB)

IV K = are added = the sum are =

V AB, DB, AB = P

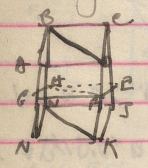
V Perimeter of a reg. polygon is = to the sum of its sides

VI $S = \frac{lP}{2}$
or $l = \frac{1}{2}lP$

VI Substitution

Q.E.D.

The plane passed thru. diagonally opp. to edges of a parallelepiped divides the parallelepiped into 2 equivalent Δ prisms



Given: plane HF passed thru opp. edges of AM & CJ of the parallelepiped AJ

To prove: AJ divides into 2 equivalent Δ prisms ABD-M & MAK-A

I Construction: EP⊥SH

I The polygon formed by the intersection of the lateral faces of the prism with a plane intersects all the lateral edges produced necessary and is ⊥ to the intersection

II AK∥NC
AN∥CK

II opp. sides of a ▱ parallelogram are ∥

III Pl. HG EF
HG∥EF
GF∥HE

III If 2 ∥ planes are intersected by third plane their lines of intersection are ∥

IV HGEF is a ▱

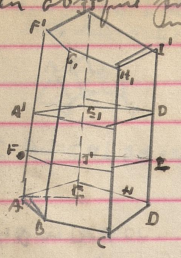
IV A ▱ is a parallelogram when opp. sides are ∥

V HGF ≅ HEF

V A diagonal divides a ▱ into 2 ≅ Δ

#22

An oblique prism whose base is equivalent to a rt. section of the oblique prism, and whose altitude is = to the lateral edge of the oblique prism



Given: Prism I = E a rt section of the oblique prism AD', and F'J'G a rt prism whose altitude is = to a lateral edge of AD'

To prove AD is equivalent to FJ'

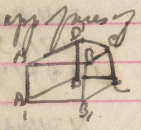
I $AA' = FF'$	I Given
II $A'F = A'F$	II Identity
III $AA' - A'F = FF' - A'F$	III = s sub from = the results are =
$AF = A'F'$	
$BG = B'G'$	
$FB = JE'$	
IV $AB = A'B'$	IV ∥ lines included between ∥ lines are =
$FG = F'G'$	
V $\angle ABG = \angle A'B'G'$	V If ∥ lines are cut by a transversal, corresp ∠s are =
$\angle FGB = \angle F'G'B'$	
VI $FB = FB'$	VI If sides of ∠s are ∥ & lie in same plane, the ∠s are =
$BH = B'H'$	
VII $BF = B'F'$	VII Bases of prisms are =
VIII $BJ = B'J'$	
~~$GE' = J'$~~	

#21

IX $GE' = GE'$	IX Identity
XI $BJ + GE' = B'J' + H'E'$	XI whole is = to sum of all its parts.
$B'J' + G'E = $ right prisms	
XIII Oblique $BE' = $ right GJ	XIII thing = to the same thing are = to each other

#21 Q.E.D.

To prove opp faces of a parallelogram are = and ∥



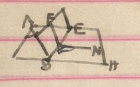
Given parallelogram AC

To prove: AB' DC', AD' B' are = and ∥

I $AB \parallel$ & DC'	I opp sides of a ▱ are ∥
$AB \parallel DC$	
$AA_1 \parallel BB_1$	
$DD_1 \parallel CC$	
II $\angle ADB_1 = \angle D'C'C$	II ∠s in different planes whose sides are ∥ respectively in the same sense are =
III $AB \parallel D'C$, $BC \parallel AD$	III If a line cut a plane
IV $AB = D'C$, $BC = AD$	IV S.A.S.

#22

If a line is ⊥ to a plane, any plane passing thru its line is ⊥ to the plane



Given: FC ⊥ AH

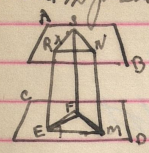
To Prove: SE ⊥ AH

I Draw CN ∥ BE & AC	I Thru a given point, one & only one line is in given plane only, plane can be passed ⊥ to a given line
II FC ⊥ AH	II Given
III FC ⊥ BE	III If a line is ⊥ to a plane it is ⊥ to every line passing thru its foot
IV ∠ FCN is a plane ∠ of S-EB-H	IV Any plane ∠ is ∠ where arms are ⊥ to the edges of a dihedral ∠ at the same point & in different planes
V FC ⊥ CN	V If a line is ⊥ to a plane it is ⊥ to every line passing thru its foot
VI ∠ FCN is a rect ∠	VI ⊥s form rt ∠s
VII ∠ S-EB-H is a rt dihedral	VII A dihedral ∠ is measured by its plane ∠
VIII SE ⊥ AH	VIII Rt dihedral ∠s are formed by rt dihedral

Q.E.D.

#18

2 ∠s ~~and triangles~~ in different planes whose sides are respectively ∥ and in the same sense are = and lie in ∥ planes



Given LRSN & EFM in plane AB and CD with RS∥EF and RN∥EM

To prove: ∠x = ∠y
AB∥CD

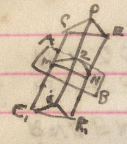
I Mark line RS = to EF and	I a line may be produced or limited
~~II~~ Mark RN = EN	
II Draw RE, SN, NM, FN	II Equals deduc. a st. line
III RSFE is a ▱	III Equal with opp. sides = and ∥, then the figure is a ▱
III RE = SN ∥ EF RN = SN ∥ EM	III Given & Construction
V. RE = NM and ∥	V Opp. sides of ▱ are = ∥
VI SF = NM	VI Lines = and ∥ to the same line are = to each other
VII SN = FM	VII. V
VIII △ RSN ≅ EFM	VIII S.S.S.
IX ∠x = ∠y	IX Corresp. parts of ≅ figures are =
X RS ∥ EF RN ∥ EM	X Given
XI RS ∥ to CD and RN ∥ to CD	XI
~~XX~~ OB ∥ CD	Every plane certain pts of 2 ∥ lines is ∥ to the other line

If 2 intersecting lines are ∥ to a plane they define a plane & that lines are ∥ to that plane.

H 20

Blank Page(s)

The lateral area of a prism is the product of a lateral edge and the perimeter of a right section



Given Prism CR lateral area P
C lateral edge

To Prove:

I $CC' = PP' = EE'$

II $MZ \perp$ to CC_1 $MZ \perp PP_1$
$ZV \perp EE_1$

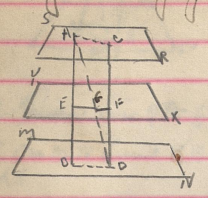
III $\square CE'$

I lateral edge of prism =

II

#19

If two lines are cut by 3 ∥ planes, their corresp. segments are proportional



Given: ~~the~~ lines AB and CD cut by ∥ planes SR, YX, MN in points A, E, B and C, F, D

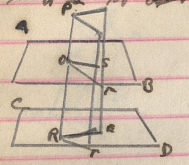
To Prove: $\frac{AE}{EB} = \frac{CF}{FD}$

I. Draw lines AC and BD also AD	I. 2 pts determine a line
II. then ADB and ACD are in 1 plane	II. 2 intersecting lines determine a plane
III. then EG ∥ BD and AC	III. If 2 or more ∥ planes are cut by another plane then the lines of intersection are ∥
IV. $\frac{AE}{EB} = \frac{AG}{GD}$ and $\frac{CF}{FD} = \frac{AG}{GD}$	IV. If then 2 segs of an Δ a line is constructed ∥ to the 3rd seg it divides the 2 segs proportionally
V. ∴ $\frac{AE}{EB} = \frac{CF}{FD}$	V. things = to the same thing are = to each other

Q. E. D.

#13

If a line is ⊥ to one of two ∥ planes it is ⊥ to ~~opposite~~ the other also



Given PQ ⊥ to AB one of 2 ∥ planes AB and CD + OR ⊥ CD

To Prove: OR ⊥ CD

I. then PR passes through 2 planes PT and PE	I. one ⊥ cannot lie in a given plane
II. PS of RE & RT are formed	II. If 2 planes intersect the intersection is a st. line
III. Since OF ∥ RT OS ∥ RE	III. If 2 ∥ planes are cut by a 3rd plane the lines of intersection are ∥
IV. PQ ⊥ AB	IV. Given
V. and CD ⊥ of OF & OS	V. If a line is ⊥ to a plane it is ⊥ to any line in the plane passing thru its foot
VI. then PQ extended or PR is ⊥ to RE & RT	VI. If a line is ⊥ to 1 of 2 ∥ lines it is ⊥ to the other
VII. PR ⊥ CD	VII. If a line is ⊥ to 2 intersecting lines at the point of intersection then it is ⊥ to

Q. E. D.

#14

2 lines ⊥ to the same plane are ∥

Given: plane MN meets PA & RS ⊥ to it

To Prove: PA ∥ RS

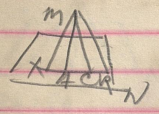
I Drawn lines PA & RS.	I 2 pts determine a line
II On MN draw KE ⊥ to AS at S	II Through a given point can only be drawn one line ⊥ to a given line in the same plane
III KS = SY	III Start line can be bisected or extended
IV Connect PA and PY to KY	IV (I)
V Since AS ⊥ bisector of KY	V Construction
VI AK = AY	VI Same to points determine perp. to the bisector of a given line is the ⊥ locus of the line
VII PY = PK	VII If points equidistant are ⊥ where lines of the bisecting meets to cut off = segments to the points are ⊥ the above lines are =
VIII PS is ⊥ bisector of XY	
IX RS ⊥ KY at S	IX If a line is ⊥ to a plane it is ⊥ to every line passing thru its foot

X AS, PS, RS, in same plane	X Every line ⊥ to a line thru its foot lies in the same plane ⊥ to the given line at the given pt.
XI PA & RS lie in same plane	XI If 2 pts of a line lie in the same plane then the whole line lies in the plane
XII PA and RS are ⊥ AS	XII reason IX
XIII ∴ PA ∥ RS	XIII 2 lines in the same plane ⊥ to the same line are ∥

Q. E. D.

#1

If diagonal circle drawn from point meet two planes cutting in 2 points then the chord the greater radius is greater



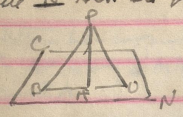
Given PA ⊥ MN etc

Prove RR > PX

I PA ⊥ PR determine a plane	I Postulate any line etc
II AR is formed	II 2 planes intersect etc
III AR is common to the planes	III Same segment
IV Mark off AC = AT	IV Construction
V Draw PC	V 2 pt det a st line
VI Given AR > AC	VI Given > only one gt part
VII PR > PC	VII #8
VIII PC = PT	#8
IX PR > PX	IX Substitution

#10

If 2 oblique lines are drawn from a point outside a plane cutting it = segments from the foot of the ⊥ then the oblique lines are =



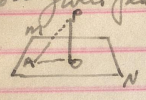
Given: PA ⊥ CN with oblique lines PB & PD as to cut it BA = AD

To Prove: BP = PD

I PA = PA	I Identity
II BA = BA	II Given
III PA ⊥ CN	III Given
IV PA ⊥ BA and AD	IV A line is ⊥ to a plane it is ⊥ to every line running thru foot of ⊥
V ∠s BAP = ∠PAD are rt ∠s	V ⊥s form rt ∠s
VI ∠BAP = ∠PAD	VI all rt ∠s are =
VII △BAP ≅ △PAD	VII S.A.S
VIII BP = PD	VIII Corresponding parts of ≅ figures are =

Q.E.D.

From a given pt outside, the ⊥ is shortest distance to a given plane



Given: PO ⊥ MN

To Prove: PO is shortest distance from P to MN

I Draw any other line PA to MN	I 2 points determine a st. line
II Plane PA is determined	II Intersecting lines determine a plane
III AO is formed	III By 2 planes intersect line of intersection is a st. line
IV AO lies in both planes	IV. line of intersection is common to two planes
V PO ⊥ AO	V. A line is ⊥ to a plane it is ⊥ to every line drawn thru its foot
VI ∠POA is a rt ∠	VI. ⊥s form rt. ∠s
VII △APO is a rt △	VII. A rt △ contains 1 rt ∠ and 2 acute.
VIII PA > PO	VIII. The hypotenuse of a rt △ is the largest side of the rt △

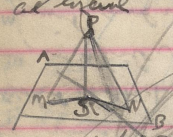
Q.E.D.

XXII AF ⊥ to FX and AX ⊥ FX — XXII If a line is ⊥ to one then it is ⊥ to all its lines passing thru its foot

XXIII — this impossible. So AF is only ⊥ MN thru point A — XXIII Only one line can be drawn from a given point to a given line in the same plane

Q. E. D.

If from a point ⊥ to a plane oblique lines are drawn to the plane such that cut off equal segments from the foot of the ⊥ then the oblique lines are equal



Given: plane AB with P ⊥ to AD and oblique lines PM and PN cutting off = segment MS and SN

To Prove: PM and PN are =

I PS is ⊥ to AB — I Given

II PM is a plane — II 2 intersecting lines determine a plane

III MN is line of intersection — III 2 planes intersect in a st. line

IV MN is common to both planes — IV Common line of intersection of 2 intersecting planes

V PS = PS — V Identity

VI ∠PSM and ∠PSN are rt ∠s — VI ⊥ lines form rt. ∠s

VII ∠PSM and ∠PSN are = — VII All rt ∠s are =

VIII △ PSM ≅ △ PSN — VIII S.A.S

IX ∴ PM = PN — IX ∴ Corresp parts of ≅ △ are =

Q. E. D.

Prove

① Prove that ∥ lines included ∥ planes are equal

② a triangle is a plane figure

③ what is a locus of all points equal distance from the vertices of a △

Locus

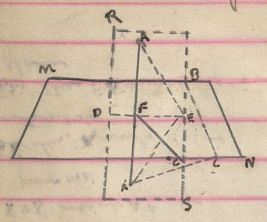
① Locus of points equal distance from the extremities of a given line is the ⊥ bisector of the line

② Locus of points equidistant from the sides of an ∠ is the ∠ bisector

③ Locus of points equidistant from a point in a plane is the circumference of a circle whose center is the given point and whose radius is the required distance.

The locus point

Thru a given external point only 1 st. line can be drawn ⊥ to a plane



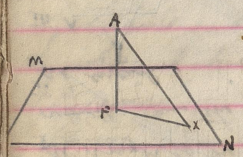
Given: MN and A

To Prove: only one ⊥ can pass thru A to the plane MN

PROOF

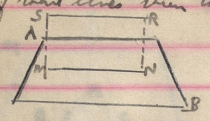
I Selected any line BC in plane MN	I 2 points determine a st. line
II Thru line A pass RS ⊥ BC	II Thru a given external point only one ⊥ can be drop ⊥ to a given line
III Line DE is formed	III 2 planes intersect the intersection is a st. line
IV DE lies in both planes	IV line of intersection is common to both planes
V In plane RS draw AF ⊥ DE	V Thru a given external point only 1 line can be drawn ⊥ to a given line in the same plane
VI Draw line SC	VI 2 points determine a st. line
VII Extend AF its own length to A'	VII a st. line can be extended indefinitely.
VIII Connect E, N, C to A, N, A'	XIII (VI)
IX Since line CD is ⊥ to plane RS by construction then CD is also ⊥ to AE and A'E	IX If a st. line is ⊥ to a plane then it is ⊥ to every st. line meeting thru its foot

X.: Since ∠ABC and ∠A'CC are rt ∠s	X ∠s formed rt. ∠s
XI ∠AEC = ∠A'EC	XI all rt. ∠s are equal
XII Since EF is the ⊥ bisector of AA'	XII Construction
XIII Then AE = A'E	VIII (b) Locus of points is the locus of all points equal distance from extremities of a line
XIV Also EC = EC	XIV Identity
XVI △AEC ≅ A'EC	XVI S. A S.
XVIII ∴ AC = A'C	XVIII Corresponding parts of ≅ △s are =
XVIII ∴ CF is the ⊥ bisector of AA'	XVIII If two points are = distance from the extremities of a given line will determine the ⊥ bisector of that line
XVIX ∴ AF ⊥ MN	XVIX st. line is ⊥ to each of the 2 lines.



XVX Suppose AF was another ⊥ from MN	
XX then FA would be line of intersection	XX 2 planes intersect is a st. line
XXI then FA would lie in both planes	XXI line of intersection is common to both planes

If 2 lines are ∥ and a plane contains only 1 of these lines then the plane is ∥ to the other line



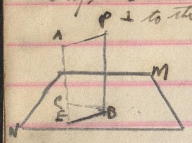
Given: SR ∥ to MN lying in plane AB

To Prove: SR is ∥ to plane AB

Proof

I SR and MN are ∥	I Given
II Suppose SN was a plane	II 2 ∥ lines determine a plane
III If SR was to cut plane AB it would at MN	(Ax) line of intersection is common to both planes and is a st line
IV But SR will never meet MN	IV ∥ lines will never meet
V then SR will never meet plane MN and must be ∥	V a line ∥ to a plane will never meet the plane

Every line ⊥ to a given line at a given point lies in a plane ⊥ to the given line at the given point



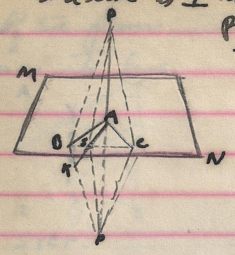
Given: MN ⊥ PB also EB ⊥ PB

To Prove: EB lies in plane MN

I Draw the plane determined by EB and PB	I 2 intersecting lines determine only 1 plane
II Suppose CB is the line of intersection	II 2 planes intersect the line of intersection is a st line
III. Then CB lies in plane MN and plane PE	III ~~the~~ (Ax) line of intersection is common to both planes
IV. PB ⊥ MN	IV Given
V also ⊥ CB	V If a line is ⊥ to a plane it is ⊥ to every line in that plane passing thru its foot
VI but PB is also ⊥ EB	VI Given
VII Since they coincide it is impossible	VII thru a given point on a given line only one ⊥ can be drawn
VIII. EB must coincide with CB and it is in plane MN	It lies in MN because it coincides with CB which is already proved to be in MN

Q. E. D.

If a line is ⊥ to 2 lines of a plane at the point of intersection, then the line is ⊥ to the plane



Given: Plane MN with PA ⊥ BA and CA at A

To prove: another line is ⊥ to PA

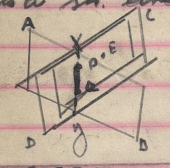
PROOF

I Select KA any line on MN passing thru A	I 2 point determine a st. line
II Draw BC meeting AK at S	II Only 1 st. line can be drawn between 2 points
III Extend PA its own length to P	III a line may be ext.
IV Connect B, S, C to P and P	IV (I)
V Since BA and CA are the ⊥ bisector of P and P	V Given and conclusion
VI then PB = PB, PC = PC	VI ⊥ bisector of a line is the locus of all points
VII BC = BC	VII Identity
VIII △PBC = △PBC	VIII SSS
IX ∠BCP = ∠BCP	IX Corresponding parts of ≅ △s are =
X in △ PSC and PSC, CS = CS	X Identity
XI △PSC ≅ △PSC	XI SAS
XII PS = PS	XII Reason IX
XIII AS is the ⊥ bisector of P and P	XIII Def
XIV PA ⊥ MN	XIV a line is ⊥ to a plane if it is ⊥ to every line in the plane running thru its ft.

Q. E. D.

Theorem #1

If two planes intersect, the line of the intersection is a str. line



Given: A.B and CD intersecting planes

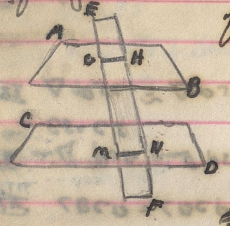
To Prove: The intersection is a str. line

PROOF

STEPS	REASONS
I Suppose P is common to both planes, then point Q is also common to both planes	I If two planes have 1 point in common they must have one other point in common
II Draw str. line P.Q	II two points determine a str line
III P.Q lies in plane CD and also in plane AB	III If two points of a str. line lie in a plane then the whole line lies in the plane.
IV Suppose another point such as E were also common to the 2 planes, then the 2 planes would coincide	IV 3 points not in the same str line determine only 1 plane
V But this is impossible because AB and CD intersect	V Given:
VI ∴ P.Q must be the line of intersection	VI The line of intersection contains all points common to both planes
VII But Xy is the line of intersection	VII Given
VIII ∴ Xy must be a str. line because it coincides with P.Q	VIII Two planes have only 1 line of intersection

Q.E.D.

If two parallel planes are cut by a third plane the lines of intersection are parallel



Given: ∥ planes AB and CD intersected by plane EF at GH and MN respectively

To Prove: GH ∥ to MN

Proof

I GH and MN are str. lines	I If two planes intersect the intersection is a str. line
II Planes AB and CD are ∥	II Given
III GH and MN will never meet	III lines in parallel planes will never meet
IV GH ~~and MN are in the same plane~~ is in plane AB and EF MN in plane CD and EF	IV The line of intersection of two planes are common to the planes
V ∴ GH is ∥ to MN	V ∥ lines are str. lines that will never meet and lie in the same plane.

a geometric solid in the space that would be occupied by a material solid

Axiom is a truth which requires no proof thereon — a geometric truth that requires no proof

given and proved propositions and conclusions

Corollary — is a truth immediately inferred from the preceding theorem and requires little or no proof

a problem is a truth concerning with a Geometric figure requiring no proof

Charles W. Adams Mathematics

SOLID-GEOMETRY

A plane is a surface in which if any two points are selected the str. line connecting them 2 points lies entirely within the surface.

What determines a plane

I 3 points, not in the same str. line
II 1 str. line and a point outside the line
III 2 intersecting lines with always the plane
IV 2 parallel lines

Possibilities of plane and str. line

1 intersect	just cause
2 parallel	no
3 Coincide	all points same
4 skew lines	no points same

Possibilities of 2 planes

1 parallel	none
2 intersect	1 line in common

Possibilities of 3 planes

1 parallel	none
2 intersect	three lines
3 1 point infinite	

SCHOOL

ARTE ET

CANGEN - GEO-

GRAPHIE

TOM I

ST. XAVIER

HIGH - SCHOOL