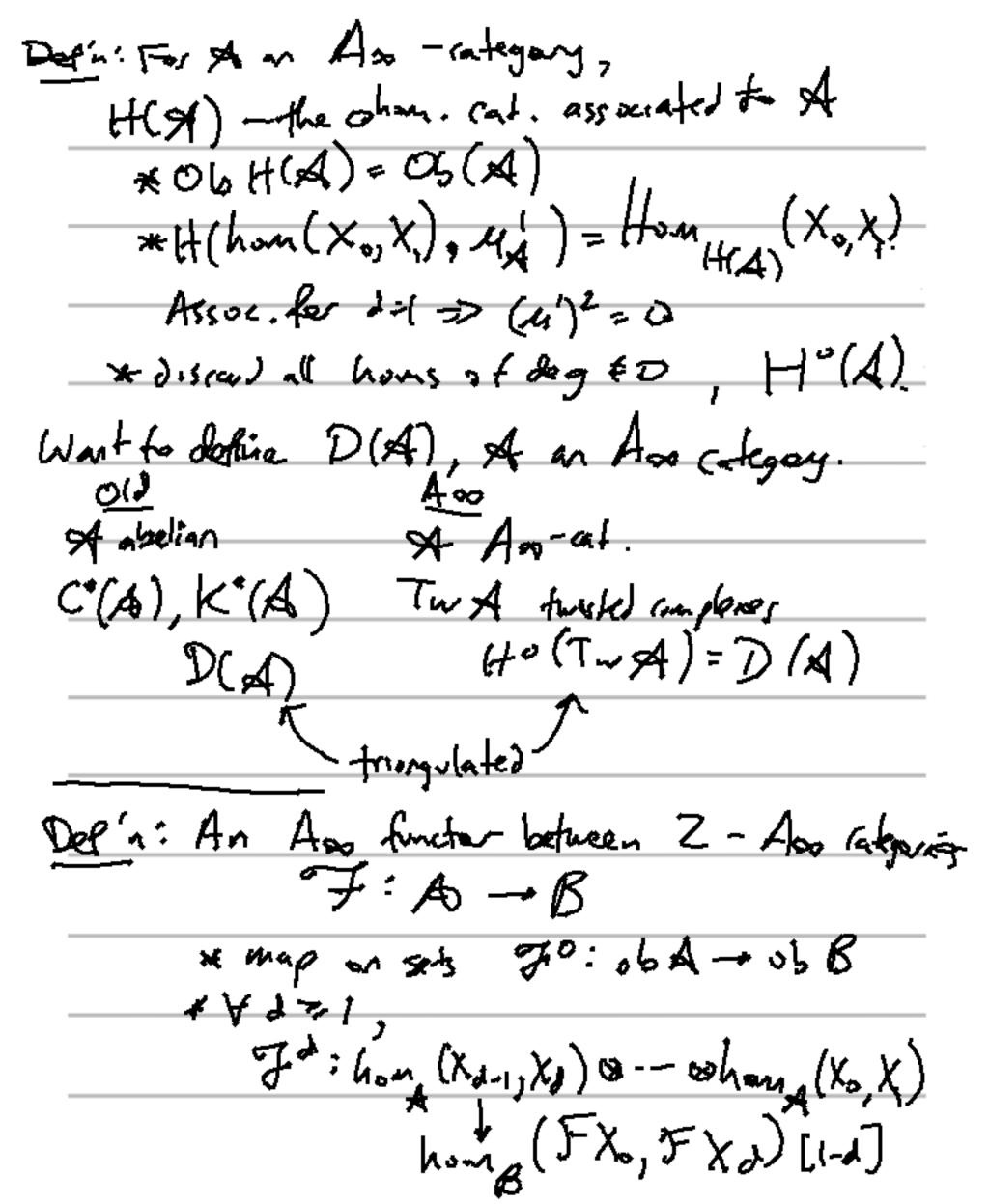
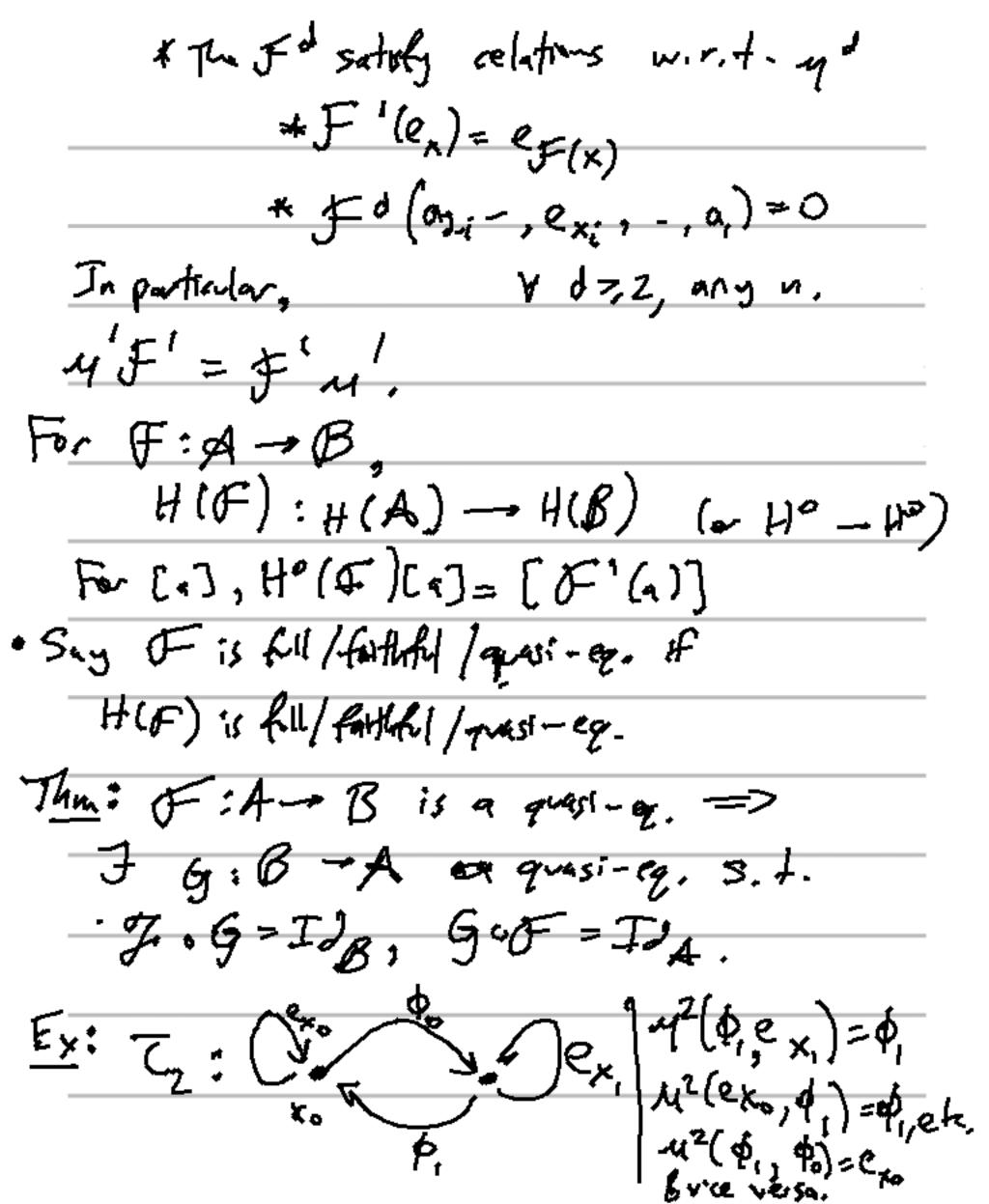
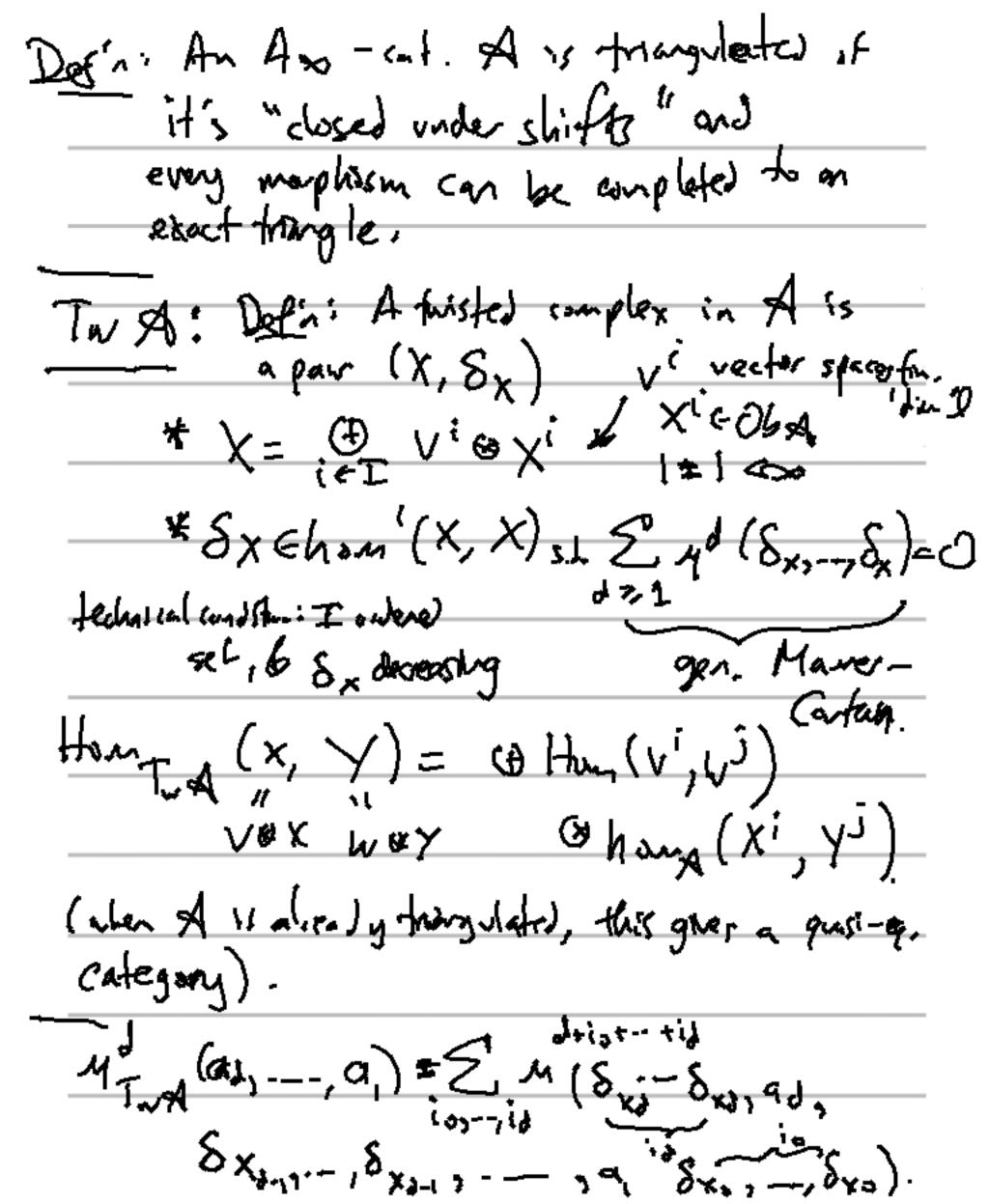
Day 3 Talk 4:
Sarah, Derived Catepries
Defn: An Asso category (strictly unital) of is aget of objects of of off off officers home (xo, X)
Quegray Azbersz Now (Xo X)
for any pair of objects Xo, X + compantion
4d: hom(X2-1,X2) 00 60 hom (X0, X,)
4 solishy the usual App equations. Additionally, $\exists e_{x} \in hom(x, X)$ (not nec. unique):
satisfy the usual App equations.
Additionally, I exchan (X,X) (not rec.
1 4 (ex) = 0
2) $\pm x_1^2(e_{x_1}a) = q = x_1^2(a,e_{x_1}) \forall a \in X_1$ $-) witheress$
3) 4 d (ad-1,, a) = 0 + d 72, a & kou(
$\forall k = 1, X_k$





Exercise: Check it's A=0
Defin: Xo, X =91, Aos are remaphic
if I Aoo Fredor F: Tz ->A
x ₀ 1— <u>X</u> _
$\times T_n \mid + (A)$, $\times \vdash \times$
X₀≃'X, .
C. \$3day O.
3 · X° (II) / (II)
Pz Pi Jacq 20
day a constant
$-4^{3}(\phi_{z},\phi_{i},\phi_{o})=e_{o}$
$43(\phi_0,\phi_2,\phi_1)=e,$ we ars:
$-43(\phi_1,\phi_0,\phi_2)=e_2$
hom (xo, x) = k \$6
hom (Xo, Xz) = 0
han(x2, x0)= 442 }dag-1.

Defin: An exact transle in A is the imagn
$\frac{1}{13} \rightarrow A$
* If G: A > B is any functor
F: T3 -191 15 smart 1, then
GoF: T3 -B is an exact Din B.
If Xo -> X, is an exact Din A, Xex,
(1) Xx than I larg example sequence
Humud (x, x) -> How H(A) (x, x) -> How H(A)
Hond (x, xo) Hond (x, x1) Hond (x, x2) Hond (x, xo) Hond (x, x2)
Geract H(x2, x) → then (x, x) → Hom (x, x)
* other Ano-analogues of A-axians which these A's satisfy.
which these D's satisfy.
(con, e.g. denie a dated the nature very easily).



"twisting yd by 8" Fact: TwA is a triangulated category. Der: D(A) = HO(TWA) * Triangulated a tegory in "old" sense. 5kt/s: X= (9) V'6Xi $SX = X[1] = \bigoplus_{i \in T} V^{i}[1] \otimes X^{i}$ 5X = 8x[1] Triangles -> Define cones of merphisms. $\frac{-f:X\rightarrow Y, M(f')=U}{Cone(f)}=\frac{S_{X}(1)}{S_{Y}(1)}$ $\frac{-f:X\rightarrow Y, M(f')=U}{S_{Y}(1)}$ $\frac{-f:X\rightarrow Y, M(f')=U}{S_{Y}(1)}$ $\frac{-f:X\rightarrow Y, M(f')=U}{S_{Y}(1)}$ Fuct: X + Y Cone (f) Ex: 01:= x 2) ex 12(ex,ex)=ex Two x = Vex garded vector space Sx-Jufferntial on V Two = dg-Veet k

 $\eta_{TuA}(F) = \delta_{x}f \pm f\delta_{x}$ Homensphisms in H(TWA) will be honotopy equivalence classes of chain maps. => Ho(TwA) = K*(Vectu) n(Vectu)