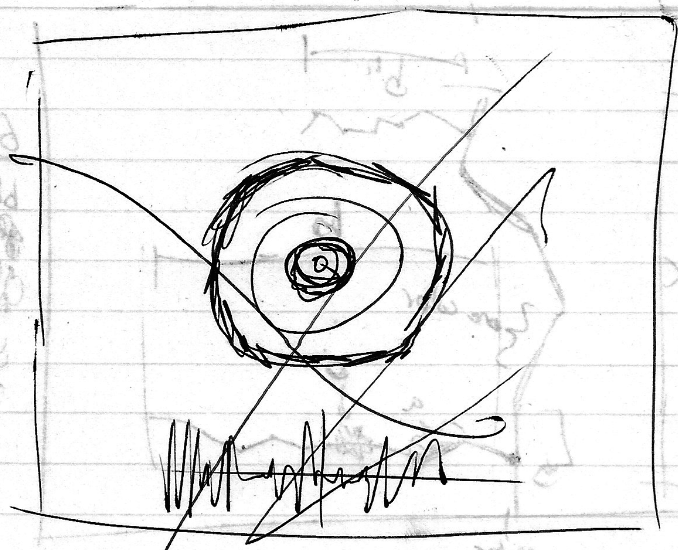
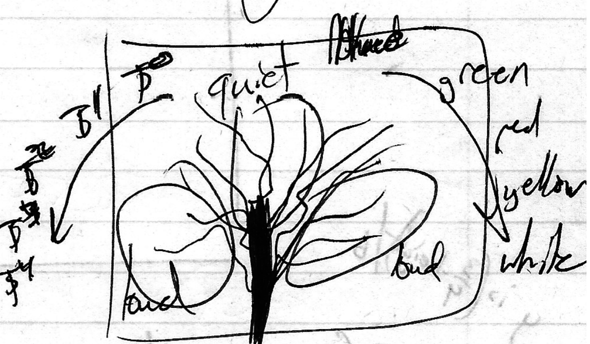
$\frac{\sqrt{32767}}{X} = T > 12$

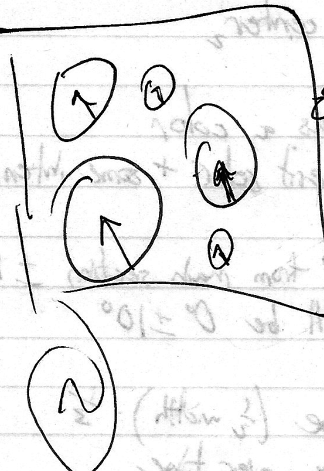
12
144
144
576
5760
14400
20736



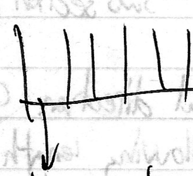
- variable thickness?



- section of values
⇒ thread?
- values of certain range (100 → 125) add to a limb (in a random direction?)
- random direction w/in 90°
- as X decreases (higher), angle becomes larger. start @ 10, increase to 120
100



← circles that shrink?



circle properties
- color
- size (decrementing)
- location
- based on audio value

- louder sound → add more
- loudness based on logarithmic scale

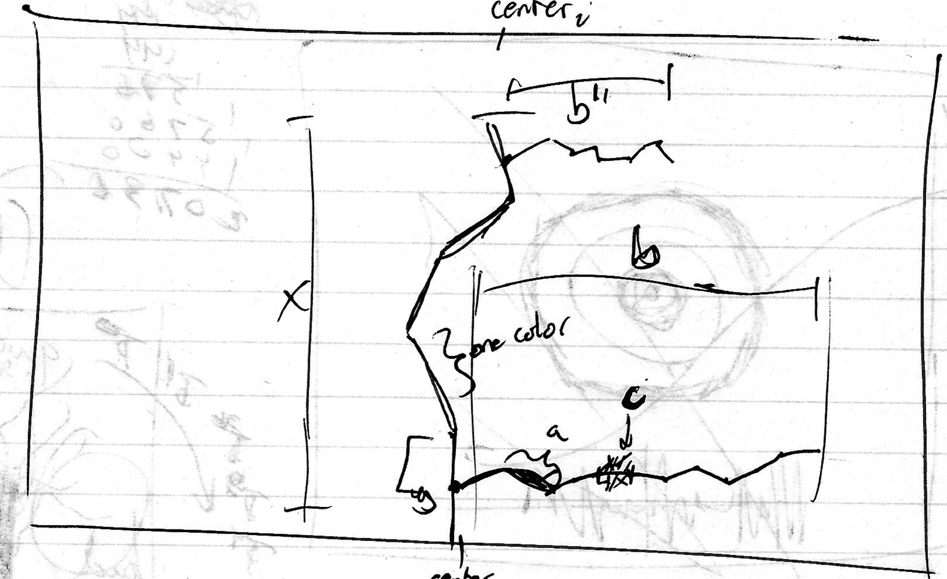
brightness
white
yellow
red
green
blue

→ color based on range

center line that always increments, stops at end @ 1/3 of height

600?

900?

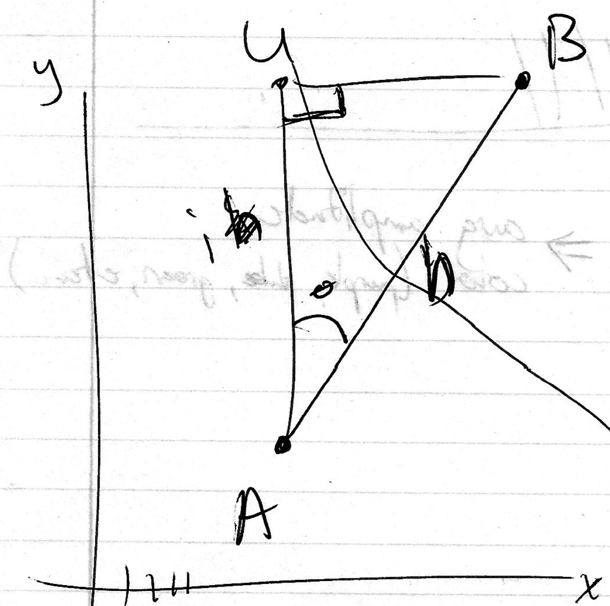


<u>6 section</u>
blue
purple
green
red
yellow
white

y is $\left(\frac{3}{4}\cdot\text{height}\right)/6$

- 6 main section
  avg of sound /6
- total length (x) is 3/4 of height
  - in each section, split section into how many sub-sects there are pixels in the length y
- b is length $\left(\frac{1}{2}\cdot\text{width}\right)\cdot\frac{2}{3}$
- a (max) can be b/10
  - total length will be based on total avg intensity? total amplitude values?
  - c is individual samples? (avgs?) from subsection. start ∠ is ±90°±30°
- there are — b sections in one y

- direction is always toward the top center (center$_2$). line can go off at an angle between -30° ⇒ 30° from direct direction toward center$_2$
- each section has a color
  - sub section inherit color + some intensity
- initial direction 90° from main section ± 10°
  - following length will be 0° ±10°
- b'' will be $\left(\frac{1}{2}\cdot\text{width}\right)\cdot\frac{1}{3}$
  - decreasing over time
- b'' initial angle is 45° ±10° from original section line
  - decreasing 90 ⇒ 45 over time
- picture made after every line drawn



$$y' = \sqrt{\frac{(y'-y)^2}{\arccos(\theta)^2} - (y'-y)^2} + y$$

$A = (x, y)$

$U = (\cancel{x + x'}, \cancel{y + y}) \quad (x, y')$

$B = (\cancel{x''}, \cancel{y + y'}) \quad (x', \boxed{y'})$

unknown known

$\cancel{\theta} = \cos\left(\frac{i}{h}\right)$

$h = i / \cos^{-1}(\theta) \rightarrow \arccos($

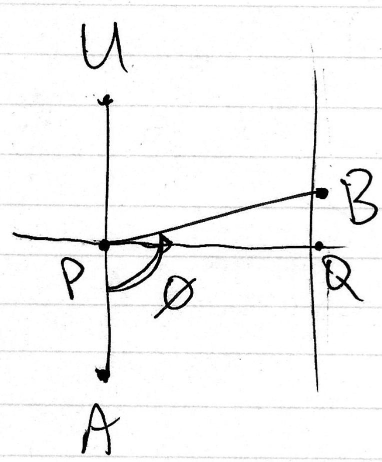
$i = \sqrt{\cancel{(x-x)^2} + (y'-y)^2}$

$h = \sqrt{(x'-x)^2 + (y'-y)^2}$

$\sqrt{(x'-x)^2 + (y'-y)^2} = \frac{\sqrt{(y'-y)^2}}{\cos^{-1}(\theta)}$

$(x'-x)^2 + (y'-y)^2 = \frac{(y'-y)^2}{\arccos(\theta)^2}$

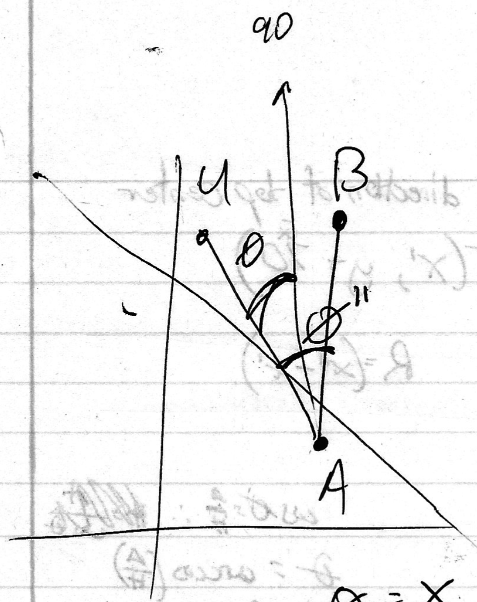
$(y'-y) = \sqrt{\frac{(y'-y)^2}{\arccos(\theta)^2} - (x'-x)^2}$



$A(x, y)$

$U(x, y')$ $\quad P(\boxed{x}, \boxed{y''})$

$B(x', y''')$ $\quad Q(x', y'')$



$A(x, y)$

$B(x', y')$

$U(x'', y'')$

$90(x, y''')$

$\theta = x$

$\theta'' = x \pm \#$

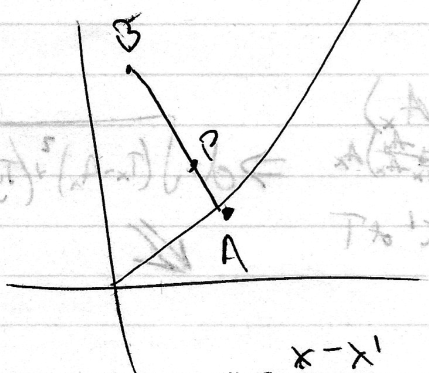
some # %10=0

$A(\cancel{x}, y)$

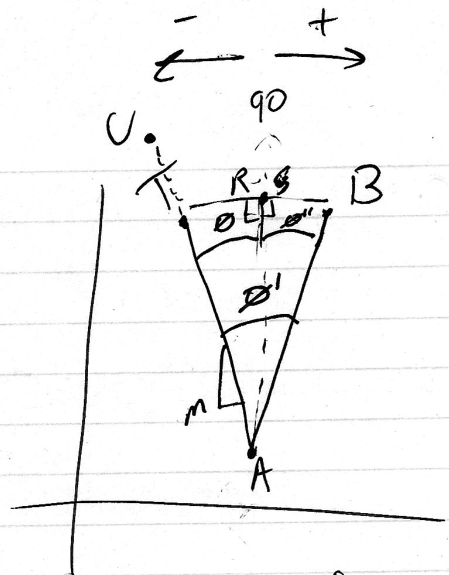
$B(x', y+70)$

$P(x'', y+(i-7))$

$y - (y+(i-7)) = m(x - x')$



$m = \dfrac{x - x'}{y - y + 70}$



T from A is in direction of top center

$A(x, y)$ $T(x', y+\overset{Q}{70})$

$B(x'', y+\overset{Q}{70})$ $R=(x''-x')$

$S(x, y+\overset{Q}{70})$

$\cos\theta = \frac{A}{H} \therefore \cancel{H=\frac{A}{\cos\theta}}$

$\theta = \arccos\left(\frac{A}{H}\right)$

$H = \frac{A}{\cos\theta}$

find θ, then given θ', find θ''

given

$A=(x,y)$

T & B are at $(y+70)$

$S=(x, y+70)$

$\overline{T} = 70/\cos\theta$

m of T is $\frac{T_y - A_y}{T_x - A_x}$

$\overset{70}{\cancel{y}} - A_y = m(x - A_x)$

$70 - A_y = \frac{T_y-A_y}{T_x-A_x}(x - A_x)$

$\cancel{y - A_y = m(x - A_x)}$

$70 - A_y = \frac{T_y-A_y}{T_x-A_x}x - \left(\frac{T_y-A_y}{T_x-A_x}\right)A_x$ $\Rightarrow d = \sqrt{(T_x-A_x)^2+(T_y-A_y)^2}$

$\frac{70 - A_y + mA_x}{m} = x'$ of T

$\theta = \arccos\left(\frac{A}{H}\right) = \arccos\left(\frac{70}{d}\right)$

if $x > x'$

$\theta \cdot -1$

$\theta'' = \theta' - \theta$

given θ''

$\overline{AB} = \frac{70}{\cos(\theta'')}$ (which is ~~AS~~)

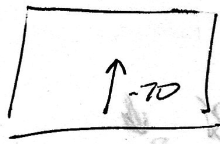
$\overline{AB} = \sqrt{(B_x-A_x)^2+(B_y-A_y)^2}$

$(\overline{AB})^2 - (B_y-A_y)^2 = (B_x-A_x)^2$

$\boxed{B_x} = A_x + \sqrt{(\overline{AB})^2 - (B_y-A_y)^2}$

$B = (B_x, A_y+70)$

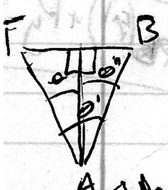
1



Given: $A = (x, y)$, B & T are at $y+70$, and θ' is $\pm 30°$

T is in direction of top center $\left(\frac{width}{2}, 0\right)$. We will call top center C. T is on line, $\therefore$ has same slope as $\overline{AC}$

$m_{\overline{AC}} = \boxed{\dfrac{C_y - A_y}{C_x - A_x}}$. To find T, we need T_x (as T_y is $A_y + 70$) $\therefore$



$y - (A_y \cancel{+70}) = m_{\overline{AC}}(x - A_x) \Rightarrow x = \dfrac{y - A_y + m_{\overline{AC}} A_x}{m_{\overline{AC}}}$

$T_x = \dfrac{(A_y + 70) - A_y + m_{AC} A_x}{m_{AC}} = \boxed{\dfrac{-70 + m_{AC} A_x}{m_{AC}}}$

$T_x = A_x$, $\theta'' = \theta'$

$\theta = \arccos \dfrac{A}{H} = \dfrac{70}{d} = \boxed{\arccos\left(\dfrac{70}{\sqrt{(T_x - A_x)^2 + (T_y - A_y)^2}}\right)}$

$\theta'' = \boxed{\theta' - \theta}$

$\overline{AB} = \boxed{\dfrac{70}{\cos(\theta'')}}$ $\quad \sqrt{(\overline{AB})^2} = \left(\sqrt{(B_x - A_x)^2 + (B_y - A_y)^2}\right)^2 - (B_y - A_y)^2$ $\quad +A_x \quad +A_x$

$B_x = \boxed{A_x + \sqrt{(\overline{AB})^2 - (B_y - A_y)^2}}$

$B = (B_x, A_y - 70)$

$m_{AB} = \dfrac{B_y - A_y}{B_x - A_x}$ $\quad y = A_y - 10n$

$y - A_y = m_{AB}(x - A_x)$

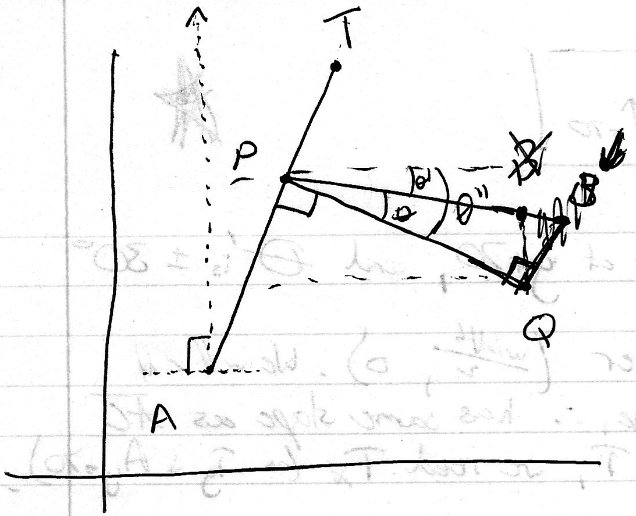
$x = \dfrac{-10 + m_{AB} A_x}{m_{AB}}$

$B' = \dfrac{(\overset{-7}{-10} \cdot 1) + m_{AB} A_x}{m_{AB}}$

$B'' = \dfrac{(\overset{-7}{-10} \cdot 2) + m_{AB} A_x}{m_{AB}}$

$B''' = \dfrac{(\overset{-7}{-10} \cdot 3) + m_{AB} A_x}{m_{AB}}$

$\vdots$



known: $A(x,y)$, $T(x,y)$, $P(x,y)$, m_{AP}, r', θ,

r' is predetermined horizontal distance

θ is predetermined angle

$$\boxed{B_x = P_x \pm r'}$$

given m_{AP}, $\boxed{m_{PQ}} = \boxed{-1/m_{AP}}$

$Q_x = P_x \pm r'$

$$\boxed{B_y = m_{PB}(\pm r') + P_y}$$

$$\boxed{\theta'' = \arctan(m_{PQ})}$$

$$\boxed{\theta' = \theta'' + \theta}$$

$m_{PB} = \tan(\theta')$

$y - P_y = m_{PQ}(x - P_x)$ $\quad Q_y = m_{PQ} Q_x - m_{PQ} P_x + P_y$

$\therefore Q_y = m_{PQ}(P_x + r') - m_{PQ} P_x + P_y = \cancel{m_{PQ} P_x} + m_{PQ} r' \cancel{- m_{PQ} P_x} + P_y$

$$Q_y = \boxed{m_{PQ} r' + P_y}$$

$$d_{PQ} = \boxed{\sqrt{(Q_x - P_x)^2 + (Q_y - P_y)^2}}$$

$\cos(\theta) = \frac{PQ}{PB}$ $\therefore PB = \boxed{\frac{PQ}{\cos(\theta)}}$

$$QB = \boxed{\sqrt{PB^2 - PQ^2}}$$

$PB = \sqrt{(P_x - B_x)^2 + (P_y - B_y)^2}$

$m_{QB} = -1/m_{PQ} = m_{AP}$

$B_y - Q_y = m_{AP}(B_x - Q_x)$

$B_y = \boxed{m_{AP} B_x - m_{AP} Q_x + Q_y}$ use once B_x is known

$PB^2 = (P_x - B_x)^2 + (P_y - m_{AP} B_x + m_{AP} Q_x + Q_y)^2$

$= P_x^2 - 2P_x B_x + B_x^2 + P_y^2 - m_{AP} P_y B_x + m_{AP} P_y Q_x + P_y Q_y - m_{AP} P_y B_x$

$+ m_{AP}^2 B_x^2 - m_{AP}^2 B_x Q_x - m_{AP} B_x Q_y + m_{AP} P_y Q_x - m_{AP}^2 B_x Q_x$

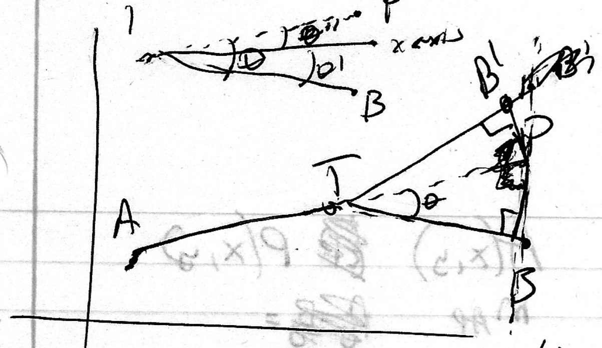
$+ m_{AP}^2 Q_x^2 + m_{AP} Q_x Q_y + P_y Q_y - m_{AP} B_x Q_y + m_{AP} Q_x Q_y + Q_y^2$

$PB^2 = (B_x^2 + m_{AP}^2 B_x^2) + (-2P_x - \overbrace{m_{AP} P_y}^{2} - \overbrace{m_{AP} Q_x}^{2} - \overbrace{m_{AP} Q_y}^{2}) B_x$

$+ (P_x^2 + P_y^2 + \overbrace{m_{AP} P_y Q_x}^{2} + \overbrace{P_y Q_y}^{2} + m_{AP}^2 Q_x^2 + \overbrace{m_{AP} Q_x Q_y}^{2} + Q_y^2) - PB^2$

double check

plug in Quadratic.
use + if θ is +, − if θ is −



Known: $A(x, y)$, $T(x', y')$

$P(x'+r, \square)$

$B(x'+r, \square)$ r(determined earlier)

$P_y = \boxed{T_y + (T_y - A_y)}$

$d_{TP} = \boxed{\sqrt{(P_y - T_y)^2 + (P_x - T_x)^2}}$

$\cos\theta = \frac{TB}{TP}$ $\quad TB = \boxed{\cos\theta \cdot TP}$

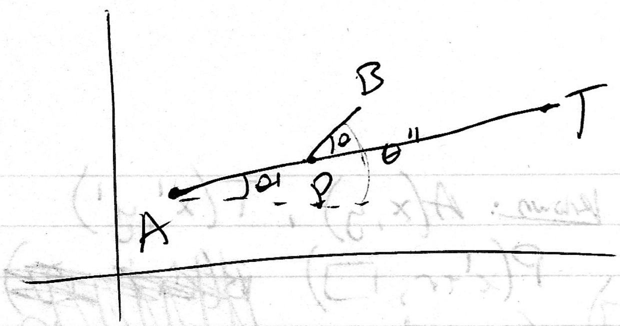
$d_{TB}^2 = (B_y - T_y)^2 + (B_x - T_x)^2$

$m_{TP} = \boxed{\frac{P_y - T_y}{P_x - T_x}}$ $\quad \theta'' = \boxed{\arctan(m_{TP})}$

$\boxed{\theta'} = \boxed{\theta'' + \theta}$ $\quad m_{TB} = \boxed{\tan(\theta')}$

$y - T_y = m_{TB}(\overset{B_x = x'+r}{x} - \overset{= x'}{T_x})$

$B_y - T_y = m_{TB}(r)$ $\quad B_y = \boxed{m_{TB}(r) + T_y}$



$A(x,y)$ ~~P~~ $P(x,y)$

m_{AP} ~~...~~ =

$B_y = P_y \pm r$

$\theta' = \boxed{\arctan(m_{AP})}$

$\theta'' = \boxed{\theta' + \theta}$

$\underline{m_{PB}} = \boxed{\tan(\theta'')}$

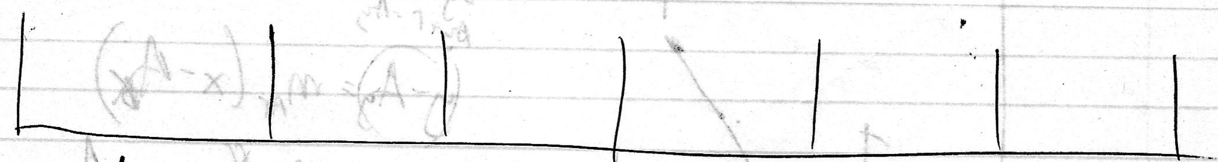
$B_y - P_y = m_{PB}(B_x - P_x)$

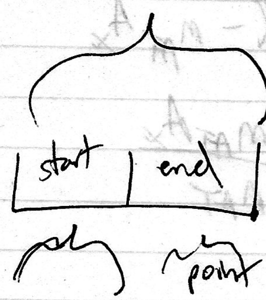
$\pm r = m_{PB} B_x - m_{PB} P_x$

$\boxed{\dfrac{m_{PB} P_x \pm r}{m_{PB}}} = \underline{B_x}$

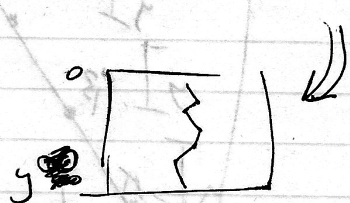
create Point OBJ

create line Obj



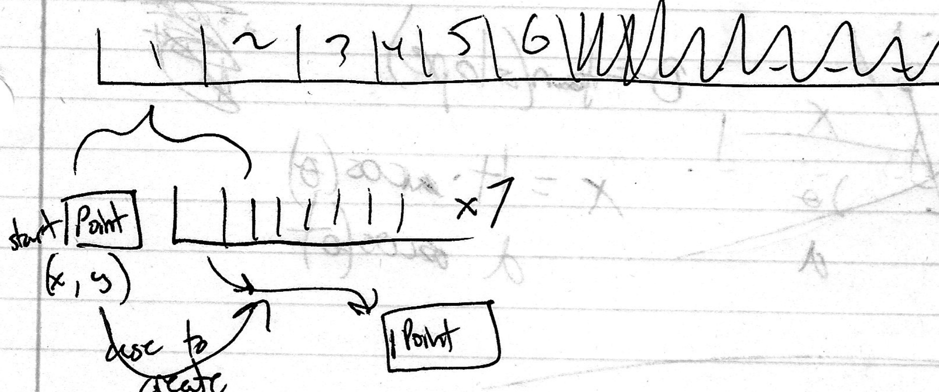


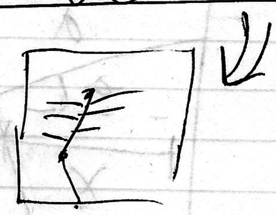
$end_y = start_y + 70$



Point OBJ

(x value, y value



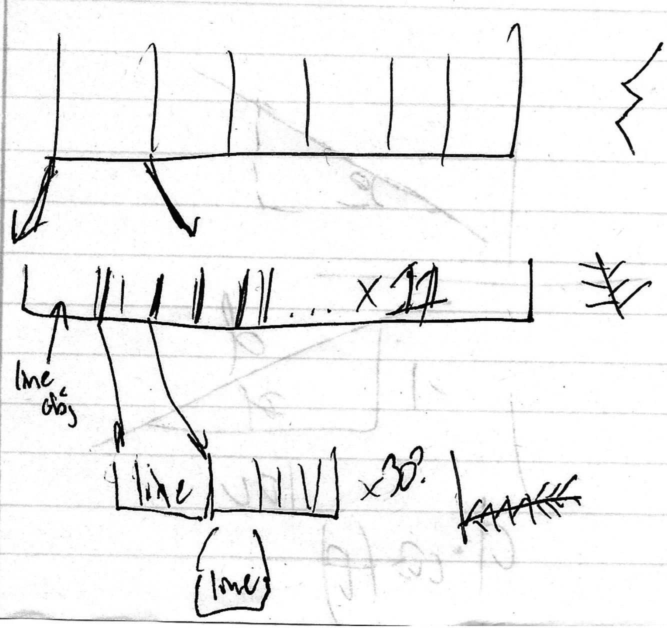


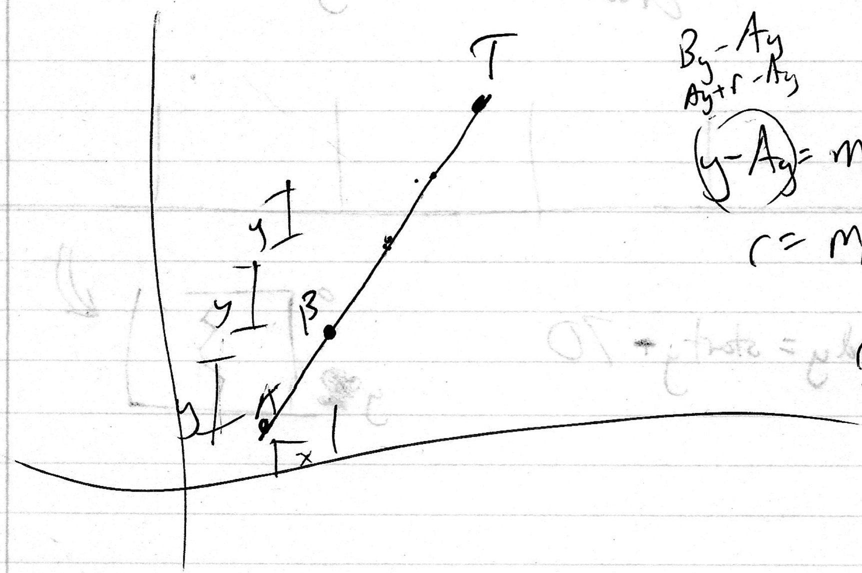
line

{ x value start
y value start
x value end
y value end }
color

draw line (picture obj)

set start X, start Y, ...





$B_y - A_y$

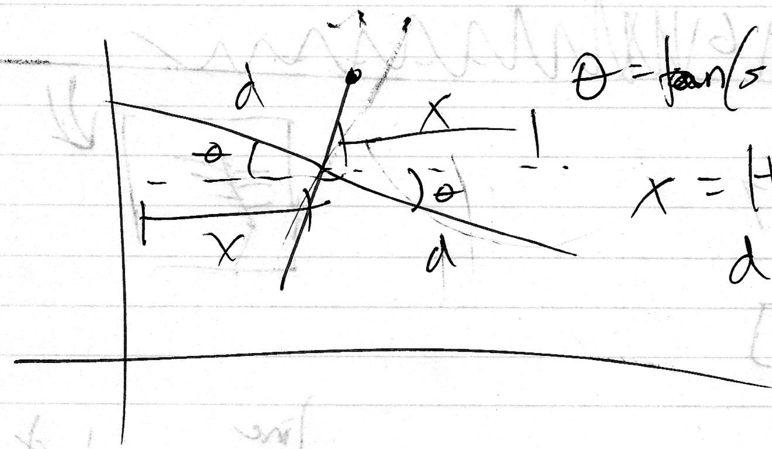
$A_y + r - A_y$

$(y - A_y) = m_{AT}(x - A_x)$

$r = m_{AT}x - m_{AT}A_x$

$$\frac{r + m_{AT}A_x}{m_{AT}}$$

$\cos\theta = \frac{A}{H}$



$\theta = \tan(slope)$

$x = H \cdot \cos(\theta)$

$d\ \cos(\theta)$

$x = A_x + \Delta_x$

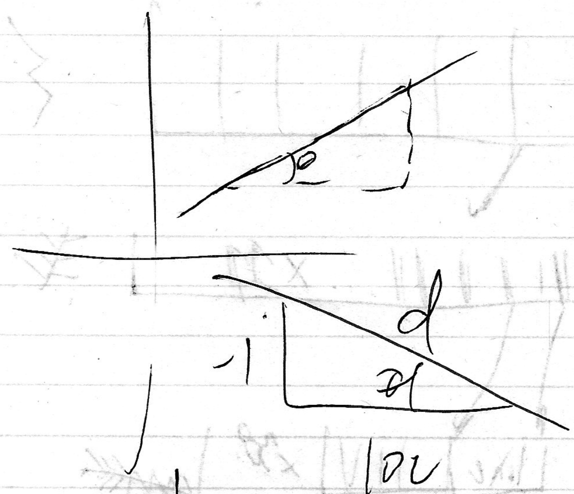
$y - A_y = m(x - A_x)$

$m\Delta_x$

$y - A_y = m\Delta_x$

$+$

$y =$



$d \cdot \cos(\theta)$