Podjetje za računalniški inženiring, d.o.o.
Pot Draga Jakopiča 26a, 1231 Ljubljana-Črnuče
telefon: 061 372 113, telefaks: 061 371 522

geometric total distance =

$$\frac{h(1-r^{(n-1)})}{1-r}$$

$h + hr + hr^2$ → takes length.

$$\frac{15}{h} = \left(\frac{1-r^{(n-1)}}{1-r}\right) \quad \left(\frac{1-r^{(n+1)}}{1-r}\right) \quad \frac{(1-r^{(n-1)})(1+r)}{1-r(1+r)}$$

$(1-r^2)$

$(1-r)(1+r$

$= (1-r^n)(1+r) = \quad 1 + r^{(n-1)}$

$= 1 + r^{(n-1)} - r^n + r^{n+1}$

$$h\left[(1-r^{n-1})(1-r)^{-1}\right] \quad \left(\frac{1-r^{n-1}}{1-r}\right)h = \text{distance}$$

$r^{(n-1)} = 1 - \frac{\text{dist}(1-R)}{h}$

$$\frac{\text{distance}}{h}(1-R) = 1 - r^{n-1}$$

$$\frac{\text{distance}}{h}(1-R) - 1 = r^{n-1}$$

$$n = \frac{\log x}{\log R} + 1$$

$$\frac{\log x}{\log r} = n - 1$$

Podjetje za računalniški inženiring, d.o.o.
Pot Draga Jakopiča 26a, 1231 Ljubljana-Črnuče
telefon: 061 372 113, telefaks: 061 371 522

$$X = -1\left(\frac{dist}{h}\right)(1-R)+1$$

$$\cancel{X} = 1 - \frac{dist}{h}(1-R)$$

$$\frac{\log\left[1-\frac{dist}{h}(1-R)\right]}{\log R} + 1 = n$$

given r, distance, calculate N

take higher

$$\log x = (\log r)(n-1)$$

$$\sqrt[n-1]{x} = r^{n-1}$$

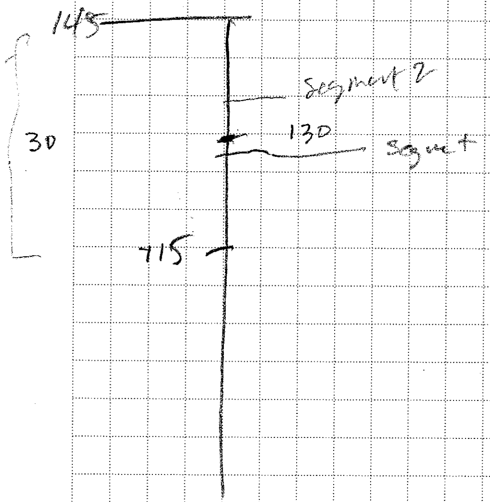
$$= r$$

Seth

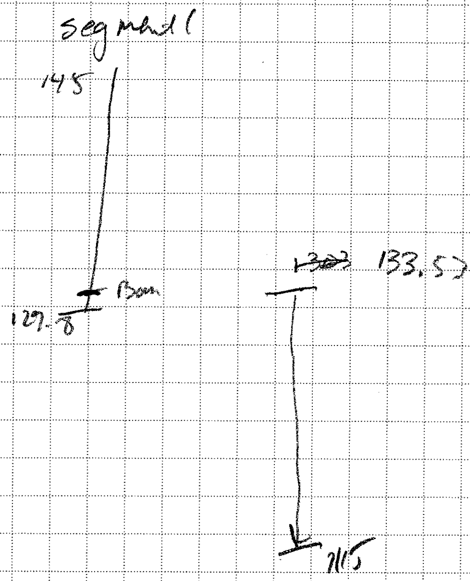
814-441-5663

MIRO
Podjetje za računalniški inženiring, d.o.o.
Pot Draga Jakopiča 26a, 1231 Ljubljana-Črnuče
telefon: 061 372 113, telefaks: 061 371 522

first time through difference is +
means we went too far – calc length > actual
then last distance has to be decreased by
differen

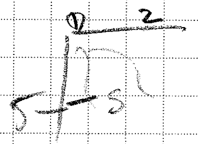


145, 130
130, 115



~~VARS~~

~~Soll at~~ ~~st~~ seeding at 5cm



1-4
16-19
31-37
46-50
61-66
76-80
91-96

106-110
121-125
13~~6~~-1

THE UNIVERSITY OF ARIZONA®

r has to be adjusted when n is known
and sum

$r = \left(\frac{a_n}{a_1}\right)^{1/(n-1)}$ when we know sum & n approximately

what if we want n known
then must adjust r

let $a_1 = 0.25$
sum = 80
$a_n = 5$ cm
$r = 1.108825$

$\frac{a_2}{a_1}$ ~~r~~

$A_n = a_1 r^{n-1}$

$\log r = \frac{1}{n-1}\left[\log\left(\frac{a_n}{a_1}\right)\right]$ ~~log r~~ $n-1 = \frac{\log\left(\frac{a_n}{a_1}\right)}{\log(r)}$

$n = \left[\frac{\log \frac{a_n}{a_1}}{\log \frac{a_2}{a_1}} + 1\right]$ [cannot specify n]

need n to calc a_n

$\frac{a_2}{a_1} = \frac{a_n}{a_1}$ choose $\frac{a_2}{a_1}$ ratio

Calculate n based on an

~~calculate~~ calculate n based on a_n & r
know final ~~length~~ = interval 0.25 → 5
~~to~~ n, & r are unknown

THE UNIVERSITY OF ARIZONA®

~~2/10 cm distructive~~ measurements

~~SB2D10 Dry weight(Shoot)~~ — dry weights ~~from~~ July

geometric progression

$\log x^n = nx$

$AN = AR^{*(n-1)}$

B2 * A1 (A3-1)

B2 is the seed (for initial increment)

A1 = constant (here 1.276)

~~B2~~ = A3 = iterator (n) or increment #

~~AN~~ = (1)

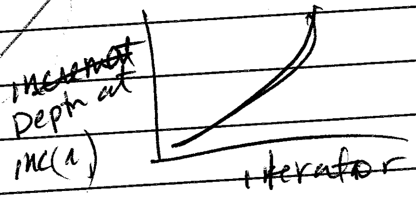
first increment is set that $AN = AR^0 = 1$, $n = 1$

result is that 1st increment increases Depth.

exponentially

$ax^b = y$

$\log a + b \log x = \log y$



~~aA~~ $A_n = ar^{n-1}$ ratio r = start/finish

.25 → 85 in 30 nodes

$a_{30} = a_1 r^{(30-1)}$ $\sqrt[29]{\left(\frac{a_{30}}{a_1}\right)}^{1/29} =$ $\frac{a_1}{a_{30}} = \frac{1}{r^{30-1}} = r^{(30-}$

$\log a_1 - \log a_{30} = -29 \log r$ $\frac{\log .25 - \log 5}{29} =$ $= \log$

THE UNIVERSITY OF ARIZONA®

method determine r - has to be input
~~get fin.~~
get total dept.

then calculate n as

$$\frac{\log\left[1 - \frac{(1-\cancel{r})\,sum}{a_1}\right]}{\log r} = n$$ number of increment

to get an initial estimate of r - r will have to be adjusted after word

~~make into a subtraction~~

€ ~~get~~ round cou

$\frac{a_n}{a_1} = r^{1/34}$

$Sum = \frac{1-r^n}{1-r} \cdot a$ $\quad \frac{Sum}{a} = \frac{1-r^n}{1-r}$ $\quad \frac{80}{0.25}$ $\quad \frac{1-r^n}{1-r}$

need to optimize r

$(1-r)x = 1-r^n$

$x - rx = 1 - r^n$ $\quad x = \frac{a_n Sum}{a_1}$

$x - rx - 1 = r^n$

$r^2 - rc$
$= r(r-c)$

$\cancel{c} - 1 = r^n - r\cancel{c}$

$c-1 = r^n - rc$
$c-1 = r(r^{n-1} - c)$

$\frac{c-1}{(r^{n-1}-c)} = r\cancel{(r^{n-1}-c)}$

$\frac{a_n}{a_1} = r^{n-1}$ $\quad \frac{a_n}{a_1} =$ so

THE UNIVERSITY OF ARIZONA®

$$Sum = \frac{1-r^n}{1-r} \cdot a_1$$

$$\frac{a_n}{a_1} = r^{(\cancel{1/n-1})}$$

$$\frac{a_n}{a_1} \cancel{= r} ($$

$$\frac{a_n}{a_1} = r^{1/n-1}$$

$$-\frac{(1-r)\,Sum =}{a_1} + 1 = r^n$$

$$-\frac{\left(1-\cancel{\frac{a_n}{a_1}}r\right) sum}{a_1} + 1 = \left(\frac{a_n}{a_1}\right)^n$$

$$\log X = n \log\left(\frac{a_n}{a_1}\right)$$

$$X = \cancel{\frac{1-}{a_1}}\left[\cancel{\frac{\left(1-\frac{a_n}{a_1}\right) Sum}{a_1}}\right]$$

$$\frac{\log X}{\log \frac{a_n}{a_1}} = n$$

$$X = 1 - \left[\frac{(1-r)\,Sum}{a_1}\right]$$

$$\frac{a_n}{a_1} = r^{1/(n-1)}$$

sum = 80 last increments

let's choose ~~A = 40~~

$$\frac{a_n}{a_1} = r^{(1/n)} \Rightarrow \log\left(\frac{a_n}{a_1}\right)^{-1} = \frac{1}{n}$$

$$\frac{\log r}{\log\left(\frac{a_n}{a_1}\right)} = n$$

$$\frac{}{\log r}$$

$$\cancel{Sum} = \frac{\log\left[1 - \frac{[(1-R)\,sum]}{a_1}\right]}{\log r} = n$$

THE UNIVERSITY OF ARIZONA®

sum of geometric progression is

unknown is a_n

$$Sum = \frac{1-r^n}{1-r} * a_1$$

$$r = \left(\frac{a_n}{a_1}\right)^{1/29}$$

$$\frac{Sum}{a_1}\left[1-r\right] = 1-r^n$$

$$\frac{Sum}{a_1} - \frac{Sum}{a_1} r = 1-r^n$$

$$\frac{Sum}{a} = \frac{Sum \cdot r}{a_1} + \left(1-r^n\right)$$

set ratio r known

n is unknow sum is known

thus n =

$$\frac{Sum(1-r)}{a_1} - 1 = r^n$$

$$\frac{\log\left[\frac{Sum \cdot (1-r)}{a_1} + 1\right]}{\log r} = n \cancel{\log r} = r$$