Dividing a pie:

Marry		John	
1	$\longrightarrow$	0	1

Dividing a pie – 2 rounds:

Marry		John	
	$\longrightarrow$		1
0	$\longleftarrow$	$\frac{1}{2}$	$\frac{1}{2}$

Dividing a pie – 2 rounds:

Marry		John	
$\frac{1}{2}$	$\longrightarrow$	$\frac{1}{2}$	1
0	$\longleftarrow$	$\frac{1}{2}$	$\frac{1}{2}$

Dividing a pie – 3 rounds:

Marry		John	
	$\longrightarrow$		1
	$\longleftarrow$		$\frac{2}{3}$
$\frac{1}{3}$	$\longrightarrow$	0	$\frac{1}{3}$

Dividing a pie – 3 rounds:

Marry		John	
	$\longrightarrow$		1
$\frac{1}{3}$	$\longleftarrow$	$\frac{1}{3}$	$\frac{2}{3}$
$\frac{1}{3}$	$\longrightarrow$	0	$\frac{1}{3}$

Dividing a pie – 3 rounds:

Marry		John	
$\frac{2}{3}$	$\longrightarrow$	$\frac{1}{3}$	1
$\frac{1}{3}$	$\longleftarrow$	$\frac{1}{3}$	$\frac{2}{3}$
$\frac{1}{3}$	$\longrightarrow$	0	$\frac{1}{3}$

Dividing a pie – 4 rounds:

Marry		John	
	$\longrightarrow$		1
	$\longleftarrow$		$\frac{3}{4}$
	$\longrightarrow$		$\frac{2}{4}$
0	$\longleftarrow$	$\frac{1}{4}$	$\frac{1}{4}$

Dividing a pie – 4 rounds:

Marry		John	
	$\longrightarrow$		1
	$\longleftarrow$		$\frac{3}{4}$
$\frac{1}{4}$	$\longrightarrow$	$\frac{1}{4}$	$\frac{2}{4}$
0	$\longleftarrow$	$\frac{1}{4}$	$\frac{1}{4}$

Dividing a pie – 4 rounds:

Marry		John	
	$\longrightarrow$		1
$\frac{1}{4}$	$\longleftarrow$	$\frac{2}{4}$	$\frac{3}{4}$
$\frac{1}{4}$	$\longrightarrow$	$\frac{1}{4}$	$\frac{2}{4}$
0	$\longleftarrow$	$\frac{1}{4}$	$\frac{1}{4}$

Dividing a pie – 4 rounds:

Marry		John	
$\frac{2}{4}$	$\longrightarrow$	$\frac{2}{4}$	1
$\frac{1}{4}$	$\longleftarrow$	$\frac{2}{4}$	$\frac{3}{4}$
$\frac{1}{4}$	$\longrightarrow$	$\frac{1}{4}$	$\frac{2}{4}$
0	$\longleftarrow$	$\frac{1}{4}$	$\frac{1}{4}$

Dividing a pie – 4 rounds:

Marry		John	
$\frac{3}{5}$	$\longrightarrow$	$\frac{2}{5}$	1
$\frac{2}{5}$	$\longleftarrow$	$\frac{2}{5}$	$\frac{4}{5}$
$\frac{2}{5}$	$\longrightarrow$	$\frac{1}{5}$	$\frac{3}{5}$
$\frac{1}{5}$	$\longleftarrow$	$\frac{1}{5}$	$\frac{2}{5}$
$\frac{1}{5}$	$\longrightarrow$	0	$\frac{1}{5}$

Dividing a pie – 5 rounds:

Marry		John	
$\frac{3}{5}$	$\longrightarrow$	$\frac{2}{5}$	1
$\frac{2}{5}$	$\longleftarrow$	$\frac{2}{5}$	$\frac{4}{5}$
$\frac{2}{5}$	$\longrightarrow$	$\frac{1}{5}$	$\frac{3}{5}$
$\frac{1}{5}$	$\longleftarrow$	$\frac{1}{5}$	$\frac{2}{5}$
$\frac{1}{5}$	$\longrightarrow$	0	$\frac{1}{5}$

Bargaining of managers and union:

Round	Managers		Union
101	0	$\longleftarrow$	10

Bargaining of managers and union:

Round	Managers		Union
100	10	$\longrightarrow$	10
101	0	$\longleftarrow$	10

Bargaining of managers and union:

Round	Managers		Union
99	10	$\leftarrow$	20
100	10	$\rightarrow$	10
101	0	$\leftarrow$	10

Bargaining of managers and union:

Round	Managers		Union
98	20	$\longrightarrow$	20
99	10	$\longleftarrow$	20
100	10	$\longrightarrow$	10
101	0	$\longleftarrow$	10

Bargaining of managers and union:

Round	Managers		Union
97	20	←	30
98	20	→	20
99	10	←	20
100	10	→	10
101	0	←	10

Bargaining of managers and union:

Round	Managers		Union
2	500	$\longrightarrow$	500
	...		...
97	20	$\longleftarrow$	30
98	20	$\longrightarrow$	20
99	10	$\longleftarrow$	20
100	10	$\longrightarrow$	10
101	0	$\longleftarrow$	10

Bargaining of managers and union:

Round	Managers		Union
1	500	$\leftarrow$	510
2	500	$\rightarrow$	500
	...		...
97	20	$\leftarrow$	30
98	20	$\rightarrow$	20
99	10	$\leftarrow$	20
100	10	$\rightarrow$	10
101	0	$\leftarrow$	10

Compound interest

The value of a capital K_0 deposited for n years with an iterest i p.a.:

$$K_n = K_0(1+i)^n$$

Year	Capital
0	K_0
1	$K_1 = K_0 + iK_0 = K_0(1+i)$
2	$K_2 = K_1 + iK_1 = K_1(1+i) = K_0(1+i)^2$
3	$K_3 = K_2 + iK_2 = K_2(1+i) = K_0(1+i)^3$
$\vdots$	$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$
n	$K_n = K_{n-1} + iK_{n-1} = K_{n-1}(1+i) = K_0(1+i)^n$

Today value of a capital K_n, which we will obtain after n years:

$$K_0 = \frac{K_n}{(1+i)^n} = K_n\,\delta\,, \qquad 0 < \delta < 1$$

δ is called a **discont factor**

„Disconting a pie:“

Round	Marry		John
n	K_n	$\longrightarrow$	0

„Disconting a pie:“

Round	Marry		John
$n-1$	$K_n\delta$	$\longleftarrow$	$K_n(1-\delta)$
n	K_n	$\longrightarrow$	0

„Disconting a pie:“

Round	Marry		John
$n-2$	$K_n(1-\delta(1-\delta))$	$\longrightarrow$	$\delta K_n(1-\delta)$
$n-1$	$K_n\delta$	$\longleftarrow$	$K_n(1-\delta)$
n	K_n	$\longrightarrow$	0

„Disconting a pie:“

Round	Marry		John
$n-3$	$K_n\delta(1-\delta(1-\delta))$	$\longleftarrow$	$K_n(1-\delta(1-\delta(1-\delta)))$
$n-2$	$K_n(1-\delta(1-\delta))$	$\longrightarrow$	$\delta K_n(1-\delta)$
$n-1$	$K_n\delta$	$\longleftarrow$	$K_n(1-\delta)$
n	K_n	$\longrightarrow$	0

„Disconting a pie:“

Round	Marry		John
$\dots$	$\dots$		$\dots$
$n-3$	$K_n\delta(1-\delta(1-\delta))$	$\leftarrow$	$K_n(1-\delta(1-\delta(1-\delta)))$
$n-2$	$K_n(1-\delta(1-\delta))$	$\rightarrow$	$\delta K_n(1-\delta)$
$n-1$	$K_n\delta$	$\leftarrow$	$K_n(1-\delta)$
n	K_n	$\rightarrow$	0

$$\lim_{n\to\infty} K_n(1-\cdots-\delta(1-\delta(1-\delta))\cdots) = \frac{K_n}{\delta+1}$$

$$\lim_{n\to\infty} K_n\delta(1-\cdots-\delta(1-\delta(1-\delta))\cdots) = \frac{\delta K_n}{\delta+1}$$