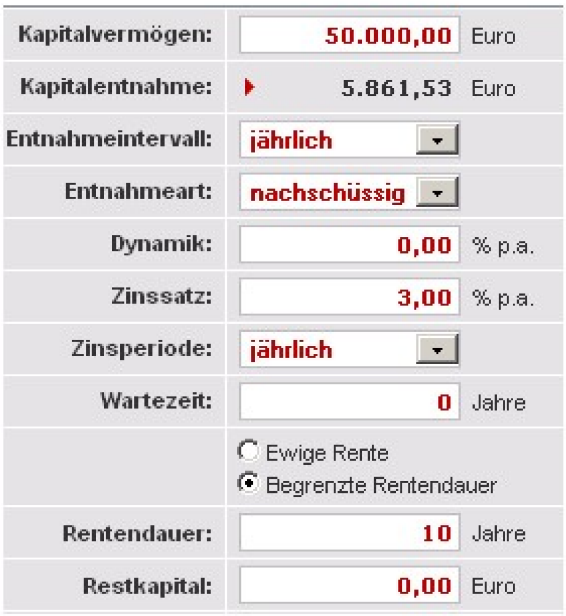
Tilgungsplan - Kapitalentnahme

1 Grundaufgabe

Figure 1: 4 Vier wichtige Berechnungen beim Tilgungsplan



(1)

(2)

Quelle: http://www.zinsen-berechnen.de

(3)

(4)

2 Berechnungen

2.1 Berechnung des Barwerts

```
(%i9) kill(all);
(%o0) done
```

```
(%i1) R:5861.53;p:3;n:10;
(%o1) 5861.53
(%o2) 3
(%o3) 10
```

```
(%i4) i:p/100.0;r:1+i;
(%o4) 0.03
(%o5) 1.03
```

```
(%i6) g:B*r**n=R*(r**n-1)/i;
(%o6) 1.343916379344122 B=67195.87250056501
```

```
(%i7) l:realroots(g),numer;
(%o7) [B=50000.03941866756]
```

```
(%i8) B:ev(B,l[1]);B:floor(B*10+0.5)/10.0;
(%o8) 50000.03941866756
(%o9) 50000.0
```

2.2 Berechnung der Rentenrate

```
(%i10) kill(all);
(%o0) done
```

```
(%i1) B:50000;p:3;n:10;
(%o1) 50000
(%o2) 3
(%o3) 10
```

```
(%i4) i:p/100.0;r:1+i;
(%o4) 0.03
(%o5) 1.03
```

```
(%i6) g:B*r**n=R*(r**n-1)/i;
(%o6) 67195.81896720608=11.46387931147073 R
```

```
(%i7) l:allroots(g);
(%o7) [R=5861.52533025798]
```

```
(%i10) R:ev(R,l[1]);R:floor(R*100+0.5)/100.0;
(%o10) 5861.52533025798
(%o11) 5861.53
```

2.3 Berechnung Zinssatz

```
(%i12) kill(all);
(%o0) done
```

```
(%i1) B:50000;R:5861.53;n:10;
(%o1) 50000
(%o2) 5861.53
(%o3) 10
```

```
(%i4) g:B*r**n=R*(r**n-1)/(r-1)
      /* Achtung: r-1 statt i */;
(%o4) 50000 r^10=5861.53(r^10-1)/(r-1)
```

```
(%i7) l:realroots(g),numer;
(%o7) [r=-0.75788161158562,r=1.030000180006027]
```

```
(%i11) r:ev(r,l[2]);p:100*(r-1);
       p:floor(p*1000+0.5)/1000.0;
(%o11) 1.030000180006027
(%o12) 3.000018000602722
(%o13) 3.0
```

2.4 Berechnung der Laufzeit

```
(%i14) kill(all);
 (%o0) done
```

```
 (%i1) B:50000;R:5861.53;p:3;
       i:p/100.0;r:1+i;
 (%o1) 50000
 (%o2) 5861.53
 (%o3) 3
 (%o4) 0.03
 (%o5) 1.03
```

```
 (%i6) g:B*r**n=R*(r**n-1)/i;
 (%o6) 50000 1.03^n=195384.3333333333(1.03^n-1)
```

```
(%i10) l:solve(g),numer;
rat: replaced -195384.333333333 by -586153/3 = -195384.333333333
rat: replaced 1.03 by 103/100 = 1.03
rat: replaced 1.03 by 103/100 = 1.03
rat: replaced -195384.333333333 by -586153/3 = -195384.333333333
rat: replaced -0.3333333333333 by -1/3 = -0.3333333333333
rat: replaced 1.03 by 103/100 = 1.03
rat: replaced 1.03 by 103/100 = 1.03
rat: replaced 1.03 by 103/100 = 1.03
rat: replaced 9.999990730680208 by 1078819/107882 = 9.999990730613078
rat: replaced 9.999990730613078 by 1078819/107882 = 9.999990730613078
rat: replaced -9.269386922748929E-6 by -1/107882 = -9.269386922748929E-6
rat: replaced -9.99999073061308 by -1078809/107881 = -9.99999073052716
(%o10) [n=9.999990730527156]
```

```
(%i11) n:ev(n,l[1]);n:floor(n*100+0.5)/100.0;
(%o11) 9.999990730527156
(%o12) 10.0
```