Задача 1
$\frac{100}{97} - 1 \approx 3\%$

Задача 2
$1 \cdot (1 + \frac{6\%}{12} \cdot 2)^6 \approx 1.06152$

Задача 3
$1 \cdot (1 + \frac{5\%}{12} \cdot 3)^6 \approx 1.07738$

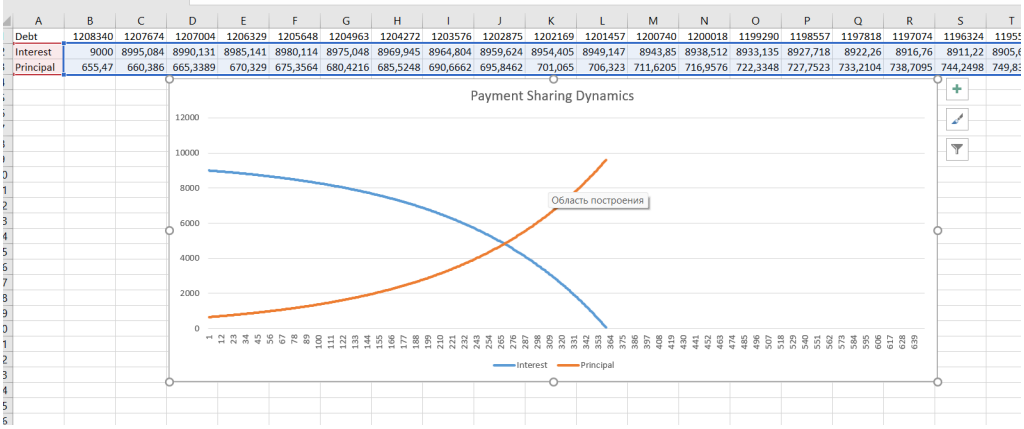
Задача 4
$(1 + \frac{6\%}{365})^n = 2 \implies n \approx 4217$ days or 11.5 years

Задача 5
$(1 + x)^3 = 1.2 \implies x \approx 6.27\%$

Задача 6
$e^{7\%} - 1 = 7.25\%$

Задача 7

The screenshot doesn't show everything. The table itself can be found at the link:
`https://docs.google.com/spreadsheets/d/1URrxnRjbiYGg3ps8ro6PprBqA1H2dnu00OeuMiUV2kI/edit?usp=sharing`



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
Debt		1208340	1207674	1207004	1206329	1205648	1204963	1204272	1203576	1202875	1202169	1201457	1200740	1200018	1199290	1198557	1197818	1197074	1196324	1195
Interest		9000	8995,084	8990,131	8985,141	8980,114	8975,048	8969,945	8964,804	8959,624	8954,405	8949,147	8943,85	8938,512	8933,135	8927,718	8922,26	8916,76	8911,22	8905,6
Principal		655,47	660,386	665,3389	670,329	675,3564	680,4216	685,5248	690,6662	695,8462	701,065	706,323	711,6205	716,9576	722,3348	727,7523	733,2104	738,7095	744,2498	749,83

Задача 8

If you will deposit 1 dollar every week for at 7% with weekly compounding you will get 752 dollars roughly after ten years. Part of the python code:

```
a = 1 * (1 + 0.07 * 7 / 365)
for i in range(2, 3650 // 7):
    a += 1
    a *= (1 + 0.07 * 7 / 365)
print(a)  # 752.5764993427772
```

Задача 9

Formula for the sum of the first n terms of a geometric progression: $b_1 \frac{1-q^n}{1-q}$, where $b_1 = \frac{CF}{1+r}$, $q = \frac{1+g}{1+r} \implies b_1 \frac{1-q^n}{1-q} = \frac{CF}{1+r} \frac{1-(\frac{1+g}{1+r})^n}{1-\frac{1+g}{1+r}} = \frac{CF}{r-g}(1-(\frac{1+g}{1+r})^n)$

Infinite decreasing geometric progression formula: $\frac{b_1}{1-q} = \frac{CF}{r-g}$

$r > g$ because in another way payments will increase more than inflation and it's PV will be infinite

Задача 10

$806070 = \frac{100000}{r-0.03}(1-(\frac{1+0.03}{1+r})^{15}) \implies r \approx 11.76\%$

Задача 11

Entering into a long forward contract you must to execute it, when buying a call option you can reject. On the other hand, you have to pay a premium to buy an option, unlike a forward

Задача 12

1. I will earn $(70-68) \cdot 400 = 800$ dollars
2. I will lose $(73-60) \cdot 400 = 1200$ dollars

Задача 13

1. Stock:
   (a) If price goes up: $\frac{1000}{200}(205-200)/1000 = 2.5\%$
   (b) If price goes down: $\frac{1000}{200}(195-200)/1000 = -2.5\%$

   Standart deviation: $S = \sqrt{0.5((2.5\%-0)^2 + (-2.5\%-0)^2)} = 2.5\%$
2. Option:
   (a) If price goes up: $\frac{1000}{5}(10-5)/1000 = 100\%$
   (b) If price goes down: $\frac{1000}{5}(0-5)/1000 = -100\%$

   Standart deviation: $S = \sqrt{0.5((2.5\%-0)^2 + (-2.5\%-0)^2)} = 100\%$

Optional: $\frac{x}{200}(205-200)/1000 = 100\% \implies x = 40000$. I would have to borrow 39000 dollars and would buy 200 stocks

Задача 14

Microsoft is more profitable

`https://posit.cloud/spaces/472515/join?access_code=otB_msYh6CZ5Y3DwyjCi2fUuN4a8OZzhgp0cAuog`