/

,
/ ,
(, , . .)
;
: , . .
, .

! **!** , ,
,
. , !

1.
( ):
– – 893;
– – 360;
– – 403;
– – 321;
– – 12;
– – 850;
– , – 590.
;
, .

:

$: T = 360$.

–

.
$: T = 403$.

:

$$\overline{T} = \frac{T + T}{2} = \frac{893 + 850}{2} = 871,5 \quad .$$

–

,

$$K_T = \frac{321 + 12}{\overline{T}} = \frac{333}{871,5} = 0,38 \qquad 38\%$$

.

–
. :

$$K = \frac{360}{403} = 0,89 , \qquad\qquad 11\% -$$

.

,   :

$$K \quad = \frac{590}{871,5} = 0,68,$$,

, 68% .

2.   :

1. , .	305
2.	105
3. , ,	24
4. , .- .	58249
5. , .- .	410
6. , .- .	13321
–	1900
–	850
–	250
– .	10321
7. , .	279

,   ,
,   ,
.   .

:   :

, .- .	, .- .

:
 	
$305 \cdot 365 = 111325$
 	
                            :
$111325 - 305 \cdot 105 = 79300$
 	
            :
$79300 - 305 \cdot 24 = 71980$
 	
     : 71980
	: 58249
	
	,
	        : $1900 + 850 + 250 = 3000$
	
	                   :
	$410 + 10321 = 10731$
	
	        : $58249 + 3000 + 10731 = 71980$

:

$$\frac{71980}{305} = 236 \qquad .$$

3.

:

	.-		.-
1.		1.	
	30150		21000
2.		2. ,	
	7210		
3.	22940		1134
4.			1134
	780	2.1.	800
5.		-	120
		-	120
	22160	-	
		-	94
		3.	26
			26
		3.1.	
		-	20
		-	6
		-	
		-	
			0

8,2 .

152372 .- .

.

:
1. , , - ;
2. ;
3. ;
4. ;
5. ;
6. ;
7. ;
8. .

: :

, .- .	, .- .
:	: 21000
30150	
:	,
22940	: 1134
:	:
22160	26
: 22160	: 21000 + 1134 + 26 = 22160

21000   .-   ,

.-   .   8,2   ,

$: 21000 \cdot 8,2 = 172200$.-   .

1.   ,   -
           ,   8,2,   -
     .

2.   :

$K \quad = \dfrac{21000}{30150} \approx 0,70$

3.   :

$K \quad = \dfrac{21000}{22940} \approx 0,92$

4.

$K \quad = \dfrac{21000}{22160} \approx 0,95$

5.   :

$n = \dfrac{30150}{30} = 1005$

6.   .

          152372   .-   .,

$: \dfrac{152372}{21000} = 7,26$.

          :

$K \quad = \dfrac{7,26}{8,2} \approx 0,88$

7.   .

$K \quad = \dfrac{152372}{21000 \cdot 8,2} \approx 0,88$

8.   .

          -

          :

$K \quad = \dfrac{152372}{22160 \cdot 8,2} \approx 0,84$

4.   I   300 ^{2},   II

350   ^{2}.   300 ^{2}.

:

1)   ;
2)   ,   ;
3)   ;
4)   ;
5)   ;
6)   ,   .

:

1)   :

$$\overline{} = \frac{_1 + _2}{2} = \frac{300 + 350}{2} = 325 \quad ^2$$

2)   :

$$a = \frac{}{} = \frac{300}{90} = 3,33 \quad ^2$$

:

$$ = \frac{}{a} = \frac{300}{3,33} = 90$$

3)   :

$$e = \frac{}{P} = \frac{300}{300} \cdot 100\% = 100\%$$

4)   :

$$K_{.} = \frac{}{} = \frac{300}{325} = 0,92$$

5)   :

$$K_{.} = \frac{\overline{}}{} = \frac{325}{300} = 1,08$$

6)   :

$$_{.} = \frac{\overline{}}{} = \frac{325}{3,33} = 97 \quad .$$

5.

200 ^{2}, 30%.

40 ^{2}, 32 ^{2}.

:

1) :

) ;

) ;

) ( )

2) :

) ( ) ;

) (,)

( ) .

:

1)

)

: K $= \dfrac{}{}$

, :

$_0 = 200$, i $= 1 - 0{,}3 = 0{,}7$

: $_1 = i$ $\cdot$ $_0 = 0{,}7 \cdot 200 = 140$ ^{2}

I :

$40 \cdot 90 = 3600$ $^2 -$.

K $_{(0)} = \dfrac{3600}{200} = 18$.

II :

$32 \cdot 90 = 2880$ $^2 -$.

K $_{(1)} = \dfrac{2880}{140} = 20{,}6$.

) :

$= \dfrac{}{K}$

1- : $_0 = \dfrac{90}{18} = 5$.

2- : $_1 = \dfrac{90}{20{,}6} = 4{,}37$.

) ( )

:

K $= \dfrac{}{}$

1-   :

$$K \quad {}_{(0)} = \frac{200}{3600} = 0,055 \quad {}^2 \qquad 1 \qquad .$$

2-   :

$$K \quad {}_{(1)} = \frac{140}{2880} = 0,0486 \quad {}^2 \qquad 1 \qquad .$$

2)

)   (   )

: ${}_1 - {}_0 = 4,37 - 5 = -0,63$,   ,

.

)   (,

)   (   )

:

$$\Delta \overline{\quad} = \quad {}_1 - \quad {}_0 \cdot \frac{\quad {}_1}{\quad {}_0} = 140 - 200 \cdot \frac{2880}{3600} = 140 - 200 \cdot 0,8 = -20 \quad {}^2$$

$$\Delta \overline{\quad} = (\quad {}_1 - \quad {}_0) \cdot \quad \quad {}_1 = (4,37 - 5) \cdot 32 = -20,16 \quad {}^2$$

$$\Delta \overline{\quad} = (K \quad {}_{(1)} - K \quad {}_{(0)}) \cdot \quad \quad {}_1 = (0,0486 - 0,055) \cdot 2880 = -18,43 \quad {}^2$$

:

			.	.	.	.	
I .	200	40	18	5	0,055	-0,63	-20 . .
II .	140	32	20,6	4,37	0,0486		

:

,   2-   2880 ^{2},   ,

$(20,6 : 18 = 1,144)$ 14,4%,

20   ^{2} .

6.   ,   .   .

– 7000.

– 2150.

– 820.

:

– 2100;

– 1990;

– 7500.

:

1.   .

2.   ,   .

:

1.

.

:

$$K_{(\ )} = \frac{-}{} \cdot 100\% = \frac{2100}{7000} \cdot 100\% = 30\%$$

$$K_{} = 100 - K_{} = 100 - 30\% = 70\%$$

:

$$ = + + - = $$
$$ = 7000 + 2150 + 0 + 0 - 820 = 8330 \qquad . \quad .$$

:

$$ = + + - - = $$
$$ = (7000 - 2100) + 2150 + 0 + 0 - 820 - 1990 = 4240 \qquad . \quad .$$

:

$$K_{} = \frac{-}{} \cdot 100\% = \frac{8330 - 4240}{8330} \cdot 100\% \approx 49,1\%$$

:

$$K_{} = 100 - K_{} = 100 - 49,1\% = 50,9\%$$

2.   ,

.

( )   :

$$K_{} = \frac{}{} \cdot 100\% = \frac{2150}{8330} \cdot 100\% \approx 25,8\%$$

:

$$K_{} = \frac{}{} \cdot 100\% = \frac{(820 + 1990)}{7000} \cdot 100\% \approx 40,1\%$$

:

$$\overline{} = \frac{7000 + 8330}{2} = 7665 \qquad . \quad .$$

:

$$ = \frac{\overline{}}{Q} = \frac{7665}{7500} = 1,022 \qquad . \quad . \qquad\qquad 1 \qquad . \quad .$$

.

:

$$ = \frac{Q}{\overline{}} = \frac{7500}{7665} \approx 0,978 \qquad . \quad . \qquad\qquad 1 \qquad . \quad .$$

.

7. , :

	, . .
	1328
	25
	296
	148
	12
	132
	1344
	2056

:

1. :

$$= + . + + − =$$

$$= 1328 + 296 + 0 + 0 − 1481 = 1476 \quad . \quad .$$

:

$$= + . + + − − =$$

$$= (1328 − 25) + 296 + 0 + 0 − (148 − 12) − 132 = 1331 \quad . \quad .$$

2. , .

_____

:

$$K \quad = \frac{−}{} \cdot 100\% = \frac{1476 − 1331}{1476} \cdot 100\% \approx 9{,}82\%$$

:

$$K \quad = 1 − K \quad = 100 − 9{,}82\% = 90{,}18\%$$

_____

,
.

( ) :

$$K \quad = \frac{}{} \cdot 100\% = \frac{296}{1476} \cdot 100\% \approx 20{,}05\%$$

:

$$K \quad . \quad . = \frac{}{.} \cdot 100\% = \frac{148}{296} \cdot 100\% \approx 50\%$$

:

$$K \quad . = \frac{}{} \cdot 100\% = \frac{(148 + 132)}{1328} \cdot 100\% \approx 21{,}08\%$$

:

$$K \quad . = \frac{}{} \cdot 100\% = \frac{148}{1328} \cdot 100\% \approx 11{,}14\%$$

:

$$= \frac{\overline{\quad}}{Q} = \frac{1344}{2056} \approx 0,654 \qquad . \qquad . \qquad\qquad\qquad\qquad 1 \qquad . \qquad .$$

.

:

$$= \frac{Q}{\overline{\overline{\quad}}} = \frac{2056}{1344} \approx 1,53 \qquad . \qquad . \qquad\qquad\qquad\qquad 1 \qquad . \qquad .$$

.

8.   :

1.   .
2.   .
3.   .

, . .	2200	2600
, . .	1000	1250

:   ,   ,

(   ).

:

$$: \quad = \frac{V_P}{V_{CC}} = \frac{2200}{1000} = 2,2 \qquad .$$

$$: \quad = \frac{V_P}{V_{CC}} = \frac{2600}{1250} = 2,08 \qquad .$$

:

$$: \quad = \frac{V_{CC}}{V_P} = \frac{1000}{2200} \approx 0,4545 \qquad .$$

$$: \quad = \frac{V_{CC}}{V_P} = \frac{1250}{2600} \approx 0,4808 \qquad .$$

,   **1**   **45**

.   ,   **– 48**   .

2.   :

$$: T \quad = \frac{T}{K} = \frac{365}{2,2} \approx 166$$

$$: T \quad = \frac{T}{K} = \frac{365}{2,08} \approx 175,5 \qquad .$$

3)

:

$$i_K = \frac{K_1}{K_0} = \frac{2,08}{2,2} \approx 0,9455$$

$$i_T = \frac{T_1}{T_0} = \frac{175,5}{165,9} \approx 1,0577$$

5,45%,
5,77%

9. :

	9620	9677
	1209	1174

:

)
)
)
)
)
)

:

)
)   .

.

.

:

:

)   : $_{(\ )} = \dfrac{V_{P(\ )}}{V_{CC(\ )}} = \dfrac{9620}{1209} \approx 7,96$.

)   : $_{(\ )} = \dfrac{V_{P(\ )}}{V_{CC(\ )}} = \dfrac{9677}{1174} \approx 8,24$.

:

)   : $_{(\ )} = \dfrac{V_{CC(\ )}}{V_{P(\ )}} = \dfrac{1209}{9620} \approx 0,13$ . .

)   : $_{(\ )} = \dfrac{V_{CC(\ )}}{V_{P(\ )}} = \dfrac{1174}{9677} \approx 0,12$ . .

1 . .   **0,13** . .
,   **– 0,12** . .

.   365   ,

$-182,5$.

)   : $T_{( )} = \dfrac{T}{K_{( )}} = \dfrac{182,5}{7,96} \approx 22,94$

)   : $T_{( )} = \dfrac{T}{K_{( )}} = \dfrac{182,5}{8,24} \approx 22,14$

:

)   : $i_K = \dfrac{K_{( )}}{K_{( )}} = \dfrac{8,24}{7,96} \approx 1,0359$

)   : $i_T = \dfrac{T_{( )}}{T_{( )}} = \dfrac{22,14}{22,94} \approx 0,9653$

3,59%,
3,47%

:

$\Delta = V_{CC( )} - V_{CC( )} = 1174 - 1209 = -35$,

35 .

:

$\Delta = V_{CC( )} \cdot \dfrac{V_{P( )}}{V_{P( )}} - V_{CC( )} = 1174 \cdot \dfrac{9677}{9620} - 1209 \approx -28,04$.

10.   ,
:

:	. .
:	
-	1552
-	1232
	120
, :	
	905
	444
	15

:   :
$=$ $-$ $-$, $-$, $-$
, $-$.

.

: $= 1552 + 1232 - 905 - 444 + 120 + 15 = 1570$

: $= 1570$

11.

(   ):

/	:	. .
1.	:	
	-	17800
	-	12800
2.	:	
	-	9500
	-	4600
3.		540
4.		2580
5.		990
6.		6700
7.		9130
8.		2900
9.		1180

.

:

:

$= \quad - \quad - \quad , \quad - \qquad , \quad -$
$, \quad -$.

.

:
$= (17800 + 12800) - (9500 + 4600) - (2580 - 990) + 540 = 15450 \qquad .\quad .$

.

$= \quad + \quad + \quad + \quad + \quad , \quad - \qquad ,$
$- \qquad , \quad - \qquad , \quad -$.

:
$= 6700 + (2900 - 1180) + 9130 = 17550 \qquad .\quad .$

12. (, . .):

	7738
	3635
	558
	125
	3621
	663
	2395
	1034

:
1. ,
2. ,
3.

:

. :

$= - - + , -$, $-$
, $-$, $-$
.

:

$(\ ) = 7738 - 3635 - 558 + 125 = 3670$ . .

, . :

$(\ ) = + + (\ -),$ $-$,
$-$, $(\ -) -$.

:
$(\ ) = 3621 + 663 + (2395 - 1034) = 5645$ . .

3. :

$(\ ) - (\ ) = 5645 - 3670 = 1975$ . .