



4. : - - .

5. : ( ,  
25 , ),  
, , , , ,  
.

, **6** ,  
“ ”

< , ( 6):  
.  
, .  
.  
:

1. .  
2. .  
3. 6 ( , 6 1 6.  
)

4. .

5. , , .  
, - .  
, .  
, .  
- , - .

, . , - ,  
 - , ,  
 , , - 4 , ,  
 .  
 < .  
 , . ,

6:

1. : ( ) ( ).
2. : , , :
- 1 - 2 - 3 - 4 - 5 - 6 -  
 , -
3. . :
- 1 - / 2 - 3 - 4 -  
 5 - 6 -  
 3 ( ) 2 ( )  
 ),  
 ,  
 ,  
 , .

,  
 ,  
 < . : , ,  
 . :  
 :

1. 6. (1) . (2)

2. . - :

- 1 ( ):
- 1-2: ( ∴ , )

- 3-4: ( ∴ , )
- 5-6: ( ∴ , )
- **2** ( ):
- 1-2: ( ∴ , )
- 3-4: ( ∴ , )
- 5-6: ( ∴ , )

3. . (1-36).

4. , .  
 ( , , , , - ,  
 4, , ).  
 .

5. .  
 , - ,  
 .

, **4** ‘ ’ ,  
 . -

< , , .  
 :

1. **6.** ( ) . ( )  
 .

2. :

- ( ):  
 7, 7 , , , ,  
 .

- ( ):  
 1 36, 1 ( , , )  
 36 ( , ).

$$\left( \begin{array}{cc} & ' \end{array} \right)$$

< , ( ) # ,  
# . :

$$\left\{ \begin{array}{c} \vdots \\ \vdots \\ \vdots \end{array} \right\} = \left\{ \begin{array}{c} | \\ | \\ | \end{array} \right\} = \left\{ \begin{array}{c} | \\ | \\ | \end{array} \right\} = \{ 1: 2: \dots \}$$

	=	=	. 1 *	. 2		<= 12 ->	
<= 24 ->		->	=	. 1 +	. 2		
<= 4 ->		<= 8 ->		->	=	. 1 +	. 2
{	=	=	=	}			

$$\vdots$$

```

    = . ( . ( . 2 ( . (1, 6)) ( . (1, 6))
)) <| -> = . = . 1 + . 2 [< >]
= " " [ " " ]
{ = }

```

```

. , ,
.
, , - ! #, . ,

```

```

,
. ,

```

```

< . # . ,
.

```

```

// = | |
= | | // = 1 | 2 //
= | * * |

```

```

, .

```

```

// (1: ) (2:
) = 1 + 2 | <= 4 -> | <= 8 -> | _
-> // (
1: ) (2: ) = 1 * 2 | <= 12 -> |
<= 24 -> | _ ->

```

```

, .

```

```

// 1 2 = 1,
2 | 1, 2 1 > 0 && 2 > 0 -> = 1 2
= 1 2 = ( , , ) (1 - 1) (2
- 1) | _ ->

```

```

, .

```

```

1 = 6 // 2 = 6 // =
1 2

```

```

,
, " " .

```

+

&lt; ,

.

.

```

//
( . ( . 2 2 ( . (1, 6)) ( . (1, 6)))) <| (1, 2)
->      =      1 + 2      |      <= 4 ->      |      <= 8 ->
      | _ ->      =      1 2      =      //
      =      . ( . ( . 2 2 ( . (
1, 6)) ( . (1, 6)))) <| (1, 2) ->      =      1 * 2
      |      <= 12 ->      |      <= 24 ->      | _ ->
      =      1 2      =      //
      =      . ( . ( . 2 2 ( . (1, 6)) ( . (1,
6)))) <| (1, 2) ->      =      1 2
=      |      ( _ , _ , ) -> 1 +      |      -> 0
      =      =      1 2      =      //
      =      "      " [      "      "      "
      "      "      "      "      "
      ] //      [<      >]      =      0

. 2
. (1, 6)) ( . (1, 6)),      . 2 ( 1 2 -> (1, 2)) ( . (
1, 6)) ( . (1, 6)).      1 2 -> (1, 2)

```

, :

```

      =      . ( . ( . 2 ( 1 2 -> (1, 2)) ( . (1,
6)) ( . (1, 6)))) <| (1, 2) ->      =      1 + 2      |
      <= 4 ->      |      <= 8 ->      | _ ->      =      1
2      =      =      . ( . ( . 2 ( 1 2 -> (1,
2)) ( . (1, 6)) ( . (1, 6)))) <| (1, 2) ->      =
1 * 2      |      <= 12 ->      |      <= 24 ->      | _ -
->      =      1 2      =      =      . ( .
( . 2 ( 1 2 -> (1, 2)) ( . (1, 6)) ( . (1, 6))))
<| (1, 2) ->      =      1 2      =
      |      ( _ , _ , ) -> 1 +      |      -> 0      =
      =      1 2      =

```

! , , - !

.                      - -  
 <                      ,                      ,  
                     .  
                     :  
 //                      ( 1: ) ( 2:  
 ) =                      1 + 2                      |                      <= 4 ->                      |                      <= 8 ->                      |                      \_  
 ->                      //  
 1: ) ( 2: ) =                      1 \* 2                      |                      <= 12 ->                      |                      (  
                     <= 24 ->                      |                      \_ ->  
                     :  
 //                      1 2                      =                      1,  
 2                      |                      1, 2                      1 > 0 && 2 > 0 ->                      =                      1 2  
 =                      1 2                      =                      (                      ,                      ,                      )                      ( 1 - 1 ) ( 2  
 - 1)                      |                      \_ , \_ ->  
                     6 6.                      :  
 1.                      :                      ,                      :                      , 1=1                      2=1.                      ,                      2 (                      )                      1  
                     (                      ).  
 2.                      :                      ,                      :                      , 1=2                      2=2.                      ,                      4 (                      )                      4  
                     (                      ).  
 3.                      :                      ,                      :                      , 1=3                      2=3.                      ,                      6 (                      )                      9  
                     (                      ).  
 4.                      :                      ,                      :                      , 1=4                      2=4.                      ,                      8 (                      )                      16  
                     (                      ).  
 5.                      :                      ,                      :                      , 1=5                      2=5.                      ,                      10 (                      )                      25  
                     (                      ).  
 6.                      :                      ,                      :                      , 1=6                      2=6.                      ,                      12 (                      )                      36  
                     (                      ).  
 ,                      .

**2 6,**

<                      6                      (2 6),                      36                      ,                      6  
 (6\*6=36).



6 2 12,

2 6:

- 2: (1+1). : 1/36 2,78%.
- 3: (1+2, 2+1). : 2/36 5,56%.
- 4: (1+3, 2+2, 3+1). : 3/36 8,33%.
- 5: (1+4, 2+3, 3+2, 4+1). : 4/36 11,11%.
- 6: (1+5, 2+4, 3+3, 4+2, 5+1). : 5/36 13,89%.
- 7: (1+6, 2+5, 3+4, 4+3, 5+2, 6+1). : 6/36 16,67%.
- 8: (2+6, 3+5, 4+4, 5+3, 6+2). : 5/36 13,89%.
- 9: (3+6, 4+5, 5+4, 6+3). : 4/36 11,11%.
- 10: (4+6, 5+5, 6+4). : 3/36 8,33%.
- 11: (5+6, 6+5). : 2/36 5,56%.
- 12: (6+6). : 1/36 2,78%.

2 6. ,  
2 6, 6 8 ( )  
2 12 ( ).

< (2 6), 1 (1\_1) 36 (6\_6). ,  
, :

- 1: (1\*1). : 1/36 2,78%.
- 2: (1\_2, 2\_1). : 2/36 5,56%.
- 3: (1\_3, 3\_1). : 2/36 5,56%.
- 4: (1\_4, 2\_2, 4\*1). : 3/36 8,33%.

- 5: (1\_5, 5\_1). : 2/36 5,56%.
- 6: (1\_6, 2\_3, 3\_2, 6\_1). : 4/36 11,11%.
- 8: (2\_4, 4\_2). : 2/36 5,56%.
- 9: (1\_9, 3\_3, 9\*1). : 3/36 8,33%.
- 10: (2\_5, 5\_2). : 2/36 5,56%.
- 12: (2\_6, 3\_4, 4\_3, 6\_2). : 4/36 11,11%.
- 15: (3\_5, 5\_3). : 2/36 5,56%.
- 16: (4\*4). : 1/36 2,78%.
- 18: (3\_6, 6\_3). : 2/36 5,56%.
- 20: (4\_5, 5\_4). : 2/36 5,56%.
- 24: (4\_6, 6\_4). : 2/36 5,56%.
- 25: (5\*5). : 1/36 2,78%.
- 30: (5\_6, 6\_5). : 2/36 5,56%.
- 36: (6\*6). : 1/36 2,78%.

‘ ’ ( <= 12) , ‘ ’ ( 13 24) ‘ ’ ( > 24), .  
 : , , .

**7, 11, 13, 14, 17, 19, 21, 22, 23, 26, 27, 28, 29... ^.^**

< 1 6. 6 ,  
 :

- 1: (1\*1). : 1/36 2,78%.
- 2: (1\_2, 2\_1). : 2/36 5,56%.
- 3: (1\_3, 3\_1). : 2/36 5,56%.

- 4: (1\_4, 2\_2, 4\*1). : 3/36 8,33%.
- 5: (1\_5, 5\_1). : 2/36 5,56%.
- 6: (1\_6, 2\_3, 3\_2, 6\_1). : 4/36 11,11%.
- 8: (2\_4, 4\_2). : 2/36 5,56%.
- 9: (1\_9, 3\_3, 9\*1). : 3/36 8,33%.
- 10: (2\_5, 5\_2). : 2/36 5,56%.
- 12: (2\_6, 3\_4, 4\_3, 6\_2). : 4/36 11,11%.
- 15: (3\_5, 5\_3). : 2/36 5,56%.
- 16: (4\*4). : 1/36 2,78%.
- 18: (3\_6, 6\_3). : 2/36 5,56%.
- 20: (4\_5, 5\_4). : 2/36 5,56%.
- 24: (4\_6, 6\_4). : 2/36 5,56%.
- 25: (5\*5). : 1/36 2,78%.
- 30: (5\_6, 6\_5). : 2/36 5,56%.
- 36: (6\*6). : 1/36 2,78%.

7, 11, 13, 14, 17, 19, 21, 22, 23, 26, 27, 28, 29

1 6.

$\leq 12$ ), ' ' ( 13 24) ' ' ( > 24). , ,

< , , .

1. :

7  
7 (1+6, 2+5, 3+4, 4+3, 5+2,  
6+1)

```

<
        .
        :
        ,
        6
        6-
        = $("# 1")[0] = . ("2 ") //
        = [0, 0, 1, 2, 3, 4, 5, 6, 5, 4, 3, 2, 1]
        = 40 = 10 = " " = 300 $("# "). (
        ' ', ) ( , ) { . () . ( , - , ,
        ) . = . () } () { . (0, 0, . ,
        . ) ( = 0 < . ++ { = * ( + )
        = [ ] * 20 // ( , ) } }
        6
        .
        .
        -
        ,
        .

```

	6,	,
<	.	.
	,	.
= \$("# 1")[0]	= . ("2 ") //	, ,
, 6-	= [0, 0, 1, 2, 3, 4, 5,	
6, 5, 4, 3, 2, 1]	= [0, 1, 2, 3, 4, 5, 6, 5, 4,	

```

3, 2, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 2, 2, 3, 3, 4, 1]
    = [5, 4, 3, 2, 1, 0, 1, 2, 3, 4, 5]          = [0,
6, 3, 2, 2, 1, 6, 1, 2, 2, 3, 6, 0]          = [0, 0, 1,
2, 3, 4, 5, 6, 5, 4, 3, 2, 1]          = 20      = 5
= 300      = [" ", " ", " ", " ", " ", " "] $(("# ").(' ',
)      (, , ) { . () . (, - , , )
.      = . () }      ( , , ) { ( = 0
< . ++ ) { = + * ( + ) = [ ]
* 10 //      ( , , ) } }      () { . (0,
0, . , . )      ( , 0, [0])      ( , 400,
[1])      ( , 800, [2])      ( , 1200, [3])
      ( , 1600, [4]) }

```

?

<

6 .

6

```

//      ( ) { = [ ]
( = 1 <= 6 ++ ) { ( = 1 <= 6 ++ ) { = (
, ) (! [ ]) { [ ] = 0 } [ ]++ } } }
//      = ( , ) => + = ( , ) => *
= ( , ) => . ( - ) = ( , ) => / = ( , )
=> ( + ) / 2 //      = ( ) =
      ( ) =      ( ) =      ( )
      =      ( )

```

( , , .)

&lt;

. :

1. ( ):

. , 1 (1/1, 2/2, 3/3, 4/4, 5/5, 6/6),  
 1/2 (1/2, 2/4, 3/6). ,  
 , 2/3 4/5, .

2. ( ):

. , ( )  
 (1-1, 2-2, 3-3, 4-4, 5-5, 6-6), (6-1).  
 . , ,  
 .

( , )  
 .

&lt;

“ ” . ,  
 , ( , ), ,  
 , 1/6, . ,  
 .

“ ” ,  
 . , ,

“ ” ,  
 ,

“ ” ,  
 ,

“ ” ,  
 .

“ ” ,  
 .







- ’ ( ).
- --- , 4 ‘ ’ ,
- -
- < , “ ”:
1. : , - .
  2. : , .
  3. : , .
  4. : , .
  5. : , , .
- 
- < , “ ”:
1. : , “ ” .
  2. : , .
  3. : , .
  4. : , .

• —

$$, \quad 26 = \quad = \quad . \quad .$$

2.0":

1. : 6. (1) (2) ,  
( ) ( ) . (3) ,  
“ ” ( ).

2.  $\frac{1}{\sqrt{2}} \begin{pmatrix} 1 & -i \\ i & 1 \end{pmatrix}$ ,  $\frac{1}{\sqrt{2}} \begin{pmatrix} 1 & i \\ -i & 1 \end{pmatrix}$

3. - : , 3, .

‘ . , ? ,

3.  $\leq$ ,  $-$ : , 3,

\*\*\*

$$\frac{3}{3} \cdot \frac{6}{3} = 2 \quad (4)$$

1. : , . ,  
 , , (1-6)  
 ,

$\frac{1}{2} \left( \frac{1}{2} + \frac{1}{2} \right) = 1$

< , ' “ ” .

2.  $\frac{1}{2} \leq \frac{1}{2} \leq \frac{1}{2}$ . ( , )

$$: |0\rangle \quad |1\rangle$$

1. : 6- (2 6). ,

2. : 6- .

$$\left( \begin{array}{c} \text{ } \\ \text{ } \end{array} \right) \quad \left( \begin{array}{c} \text{ } \\ \text{ } \end{array} , \quad \text{ } , \quad \text{ } / \text{ } \right).$$



## 16,

$$< \begin{matrix} 6- & (1\ 6) \\ & (1-6). \end{matrix} \quad , \quad :$$

## 16

1.  $\alpha \in \mathbb{R}$  :  $\alpha \in \mathbb{R}$  . (1, 6, 6)

2. : 1-3, ' 4-5,  
, 6,

3.  $\frac{1}{\sqrt{2}} : \frac{1}{\sqrt{2}}$ ,  $\frac{1}{\sqrt{2}}$ ,  $\frac{1}{\sqrt{2}}$

4.  $\vdash$  ,  $\cdot$  .

5. : . , .

6. : , 3,

3, .

1.  $\vdash \vdash (1 \rightarrow 6)$ . ,

2.  $\vdash \neg \neg A$ ,  $\vdash A$ .

, • ’

<

- , “ ” , ,  
 , , - • , ,  
 , • , ,  
 , - , :  
**1.** :  
 • ( , , , , ),  
 ,  
**2.** :  
 • ,  
**3.** : , ( , ,  
 , • , • ). -  
**4.** : , -  
 - ,  
**5.** :  
 , ( 5 6) ( 1 2),  
 ;  
 ,  
 - ,

## 10

<

- :  
**1.** :  
 •  
**2.** :  
 •  
**3.** : , ,  
 •  
**4.** : ( ) , ,  
 •

5. : . , ' .
6. : .
7. : . , , .
8. : . ' , .
9. : .
10. : , ' .

## • 10

- < , ' :
1. : , ( ).
  2. : , ' , .
  3. : ( ) , .
  4. : .
  5. : , .
  6. : , , .
  7. : ' ' , , .
  8. - : ( ) ( ), - .
  9. : ( ) , .





**3.0: -**

1. ( ): .

- 1:
- 2:
- 3:
- 4:
- 5:
- 6:

2. ( ): .

- :
- :

3. ( ): , , . ‘

4. ( ): .

- 1-2:
- 3-4:
- 5:

5. ( ): . - . , - - , , — , . , - , , .

**. , 4.0 - 2023 9-5**

< , 9-5 , 1 6  
4.0: . ’ :  
( ): .

1. : . , , .
2. : . , , , , .
3. : . , , .
4. : . , , .
5. : . , , .
6. / : . , , .

( ): .

- : , .

- : , .

( ): , .

( ): .

- 1-2: .

- 3-4: .

- 5: .

( ): ,

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9-5 !

•

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( ): . ,

1. : .

- 1: - .

- 2: - .

- 3: - .
- 4: - .
- 5: - , , .
- 6: - , , .

2. (): .

- , , .
- , , , .

3. (): , ’

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- , .

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“ ”: -  
(): . ,

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- 1: - . 2: - .
- 3: - . 4: - .
- 5: - , 6: - ,
- (): .
- , , ( ): ,
- , ( ): .
- “ - ”, .

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“ ”.

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1: - , . 2: - ,

3: - , . 4: - ,

5: - . 6: -

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