

«

39 .

»

.01.

35.02.01.

2018 .

Рассмотрено:

На заседании ЦМК основных образовательных программ

Протокол № 9 от 29 мая 2018 г.

Председатель Искр / Н. В. Александрова

Организация-разработчик ГБПОУ ПУ № 39

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1.

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- 1. « ».
- 2. .
- 3. , .

1 8 ():

- 1. ?

1:10 1:2000

: , .

: 1:10 1:2000 20 .

- 2. () , =28.5 .

1:1000.

: () , .

:

: = 2.85

- 3. () , =7.3 .

1:2000.

: () , .

:

: = 146 .

- 4. , :

1:1000;

= 2 .

:

- 1.
- 2.

8 (.1).

= 2 (.1).

.1

- 3.
- 4.

:

) ()

(.1);

) ()

1:1000 - 20 .

)

- ;

)

() .

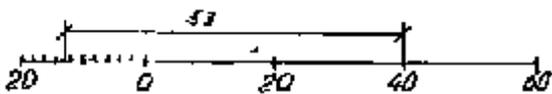
2 .

(.2).

5.

1:1000

d



.2

: 1:1000

20

(= 2),

53

2.

(53 : 23 = 2 ; 13 -)

6.5 (13 : 2 = 6.5) .1.

6.

t

1:1000.

:

t

0.5

:

1:1000.

1 - 10

0,5 = 0.05 - t

t = 10 · 0.05 = 0.10 = 10

: t = 10 .

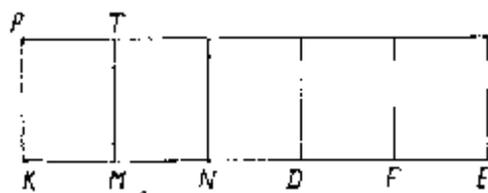
7.)

- ; = 2.5 -
; = 10 -

1:1000,
; m=10

: = 2

)



(.3). : 1.

10

.3

(I)

2. ()

= 2 (.3).

, , N, , F, .

3. , , N, , F,

= 2,5

,3 .

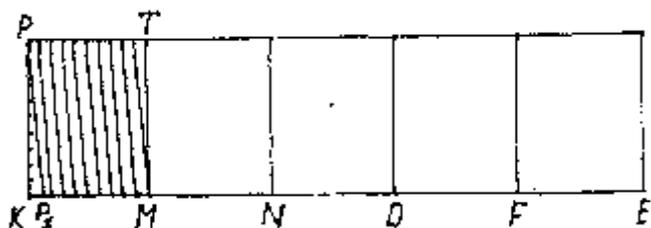
.3 (2)

4.

(.3).

5.

(.3).



.3 (3)

6.

:

)

()

(.1)

,

1 ;

)

,

1 (

1

);

)

.3 ;

)
(.3).



.3

) :

1. (. 4); ,

2. 0.01 , ...
0.2 .

7 .

: (t) 0.1 .

: 1:1000 1 - 10

0.1 - 0.01

t = 0.10

: t = 0.10

8.
= 72.9 (.4).

.4

: 1:1000 20 (= 2), . .

- 20 ;

-

72.9 :

3 (72.9 : 20 = 3 ; - 12.9);

- 6 (12.9 : 2 = 6 , - 0.9);

- 4.5 (0.9 : 0.2 = 45)

:

1. ?
2. ?
3. ?
4. ?
5. ?
6. ?
7. 1:500 1:1000. ?
8. 1:500. ?
9. 1:1000. = 5.5 . ?
10. 1:2000. = 100 . ?
11. ?

12.

1:5000.

?

2,3

:
 :
 :

- 1.
- 2.
- 3.
- 4.

- 1.
- 2.
- 3.

- 1.

) , , - (.5),
 , . . 157.5 .

.5

)
() ,

155 . h1

:

$h_1 =$

h - ()

d - ()

di - .

:

$$= 155 + 3/5 * 2.5 = 156.5$$

) .5, , ,
156.5 .

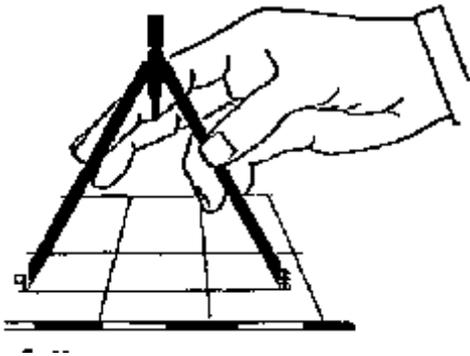
2.

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

, , .

.6 .6

(.7).



.7

, - ; - (.7 1).
 (.7 2), - ; - .

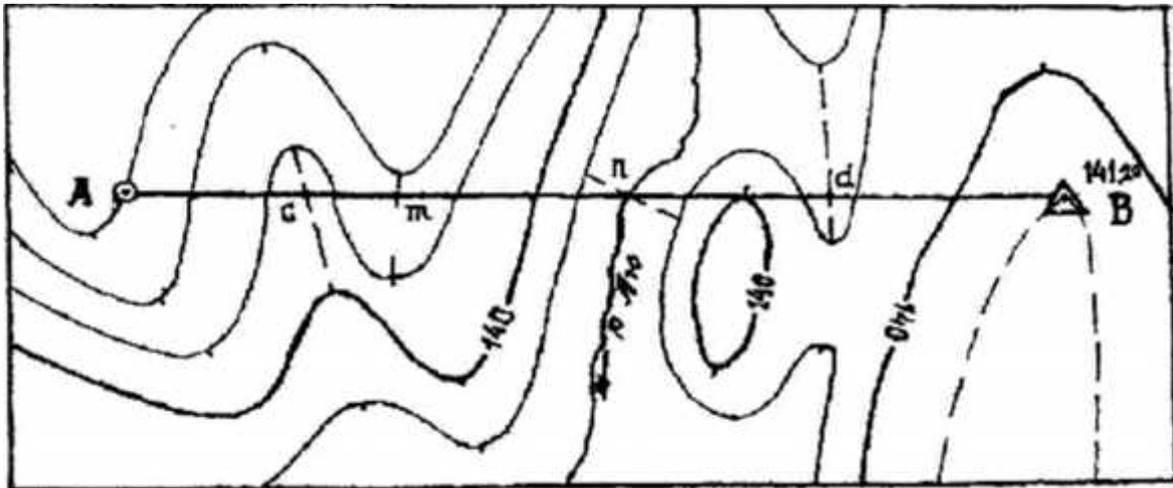
.7

1:10000 - 20 , 200 ,
 (.7) : $400 + 20 + 2 \cdot 7 = 434$. - 2 .

3.

:

(.8);



.8.

, (.9) 12-15 ;

« »

« », « »

$$H = 132,5$$

1:250

4.

(d) $h \quad d^{(h)}$

$$d = 220 ; h = \pm 6,3$$

$$i = 6,3 : 220 = 0.0286 = 28.6\%$$

:

1.

?

2.

,

?

3.

?

4.

?

5.

,

4

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1.

1:10000.

2.

3.

()

(),

. 10

:
, , (. 10) ,
.

228°00'.

:



: - ;

-

-

(= - 2°21'), (. 11) (= +6°15'). -



. 11

:

$$= 228^{\circ}00' - 8^{\circ}36' = 219^{\circ}24'$$

:



$$= 219^{\circ}24' + 6^{\circ}15' = 225^{\circ}39'$$

:

- 1.
- 2.
- 3.
- 4.

?

?

?

5

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:

:

- 1.
- 2.
- 3.

,

(. 12).

500 .

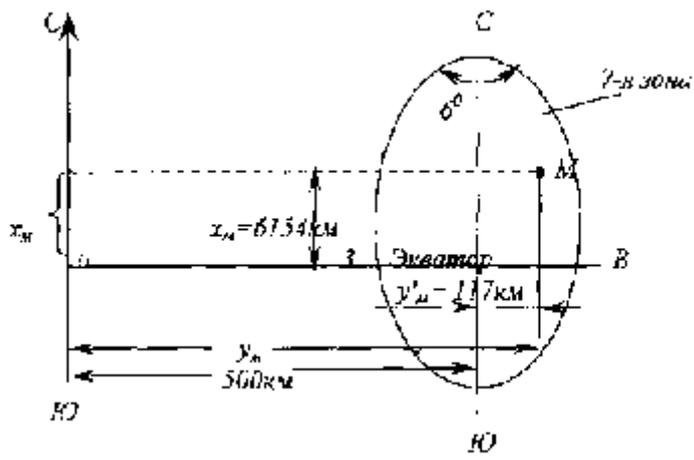
(. . 12)

$X = + 6154$
6154

$Y = + 7617$

,
Y

$$= 617 - 500 = 117$$



$$(x = 6154, y = 7617)$$

. 12

$$X \quad Y$$

(. 13).

. 13

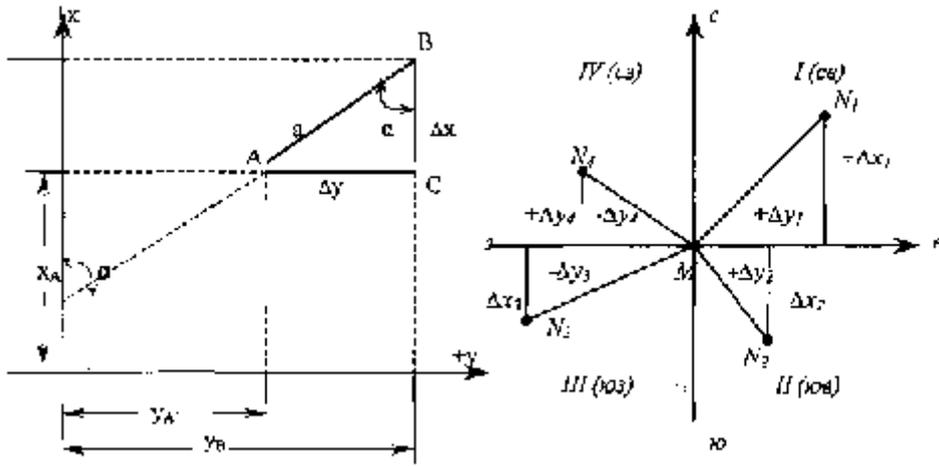
$$d \quad (x, Y_A)$$

. 14 :

$$Y_B = Y_A + y \quad (1)$$

$$x = d \cos \alpha \quad y = d \sin \alpha \quad (2)$$

$$: \quad = \pm d \cos r \quad y = \pm d \sin r. \quad (2)$$



1: :1) d , 72,48 ,
 2. r - 6°25 '.

$= +505,12$, $Y_a = +302,50$,

(1)

$Y_B:$

$= 505,12 + 72,03 = 577,15$

$Y_B = 302,50 + 8,10 = 310,60$

ABC (. . 14) :

$$\text{tg } \alpha = \frac{Y_B - Y_A}{X_B - X_A} \quad (4)$$

r $\text{tg } \alpha$

$\alpha..$

d

:

$$d = \frac{X_B - X_A}{\cos \mathcal{L}} = \frac{\Delta X}{\cos \mathcal{L}}$$
$$d = \frac{Y_B - Y_A}{\sin \mathcal{L}} = \frac{\Delta Y}{\sin \mathcal{L}} \quad (5)$$
$$d = \sqrt{x^2 + y^2}$$

:

$$= + 82,03 \quad Y = + 39,67$$

$$= + 51,51 \quad Y_B = + 75,95$$

: 1)

; 2)

d

:

1.

2.

3.

4.

5.

1

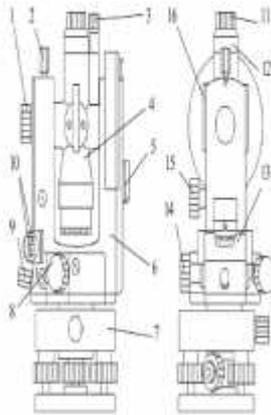
:

.

1.

4 30

(. 1).



1 - окуляр; 2 - об'єктив загальної; 3 - окуляр високої; 4, 5 - об'єктиви; 6 - столик; 7 - мікрометр; 8 - ручки притиску; 9 - об'єктив загальної; 10 - об'єктив високої; 11 - кільце окуляра; 12 - об'єктив; 13 - ручка притиску; 14 - об'єктив високої; 15 - об'єктив високої

2.

3.

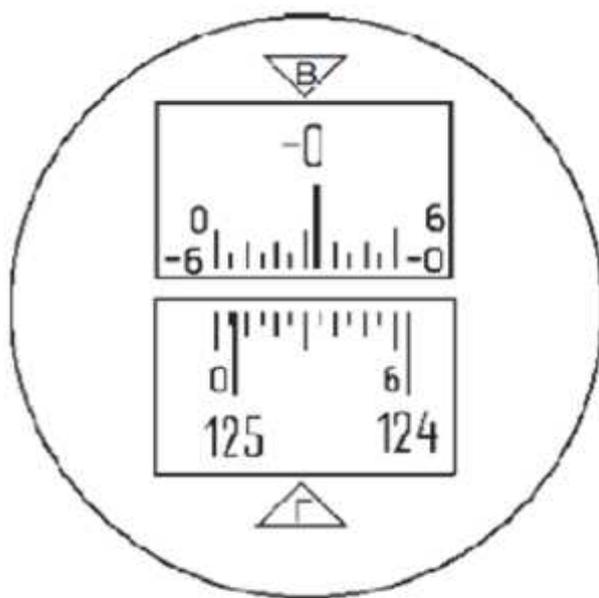
)

)

4.

2

(« ») - (« »)



а

а) для теодолитов с кругами, разделенными на 360° и с ценой деления шкал микроскопа $5'$:

показание лимба горизонтального круга $125^\circ 05,5'$;

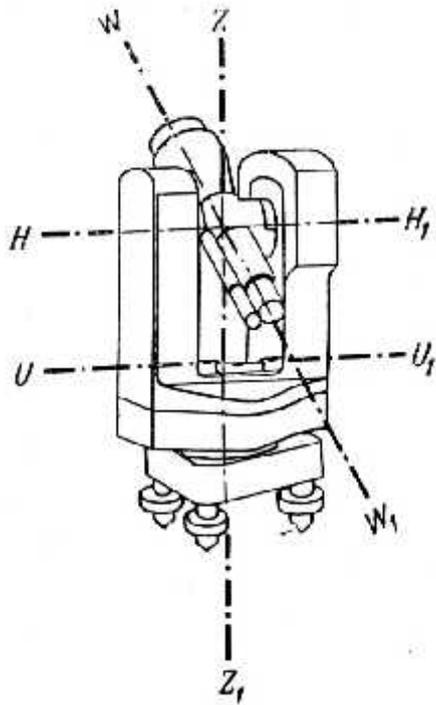
показание лимба вертикального круга минус $0^\circ 26'$;

4.

.

ZZ1 (. 23)
VV1.

1, : 1,



. 3

1.

(UU1 ZZ1).

90°

2.

(WW1 1).

;

: - =2

- $\pm 180^\circ$

: = 2t

2

t—

3. (HH1 ZZ1).

20-30

30-50°

a1.

2.

1.2 1

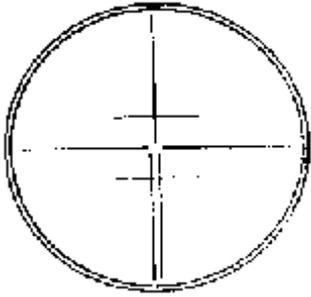
6000



.24

4.

8-10



.25

:

:

:

- 1.
- 2.
- 3.
- 4.

1.

1.

1 (. 26).



uc.26

- 2.
- 3.
- 4.

(325°40'),

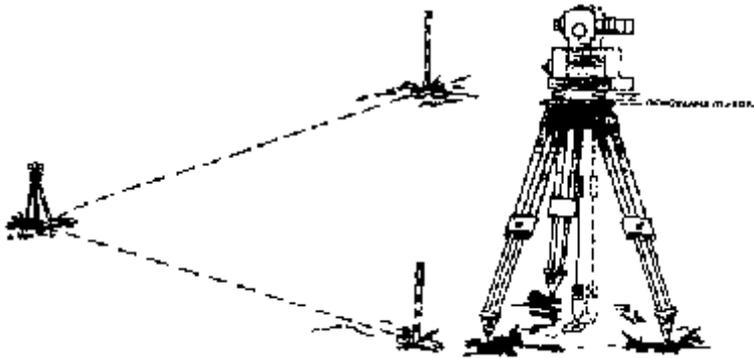
5.

(254°22')

6.

=

$$= 325^{\circ}40' - 254^{\circ}22' = 71^{\circ}18'$$



. 27

7.

« »

8.

$$(71^{\circ}18' + 71^{\circ}20') : 2 = 71^{\circ}19'$$

(.

)

1

- 1.
- 2.

2.

1.

2.

3.

« »,

(). « », ().

4.

:

$$= \underline{\quad} + \underline{\quad} = \underline{-8\ 40' + 8\ 42'} = 0\ 01'$$

2 2

4.

:

$$= \underline{\quad} - \underline{\quad} = \underline{8^{\circ}42' - (-8^{\circ}40')} = \underline{8^{\circ}41'}$$

2 2

$$= \underline{\quad} - \underline{\quad}; = \underline{8^{\circ}42' 0^{\circ}01'} = \underline{8^{\circ}41'}$$

$$= \underline{\quad} - \underline{\quad}; = \underline{0^{\circ}01' - (-8^{\circ}40')} = \underline{8^{\circ}41'}$$

2.

4.

1. 6.1

2. 6.2

,

.

:

1.

?

2.

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3.

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4.

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5.

?

6.

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7.

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3

:

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-3,

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:

, , ,

-3

2.1

-3 -

III IV

, -

2.2

3,0

2.

.....

31,5^x

3.

:

.....

.....

1°20

55

4.

1,8

5.

100

6.

15 2

7.

10 2

8.

2,0

2.3

20.

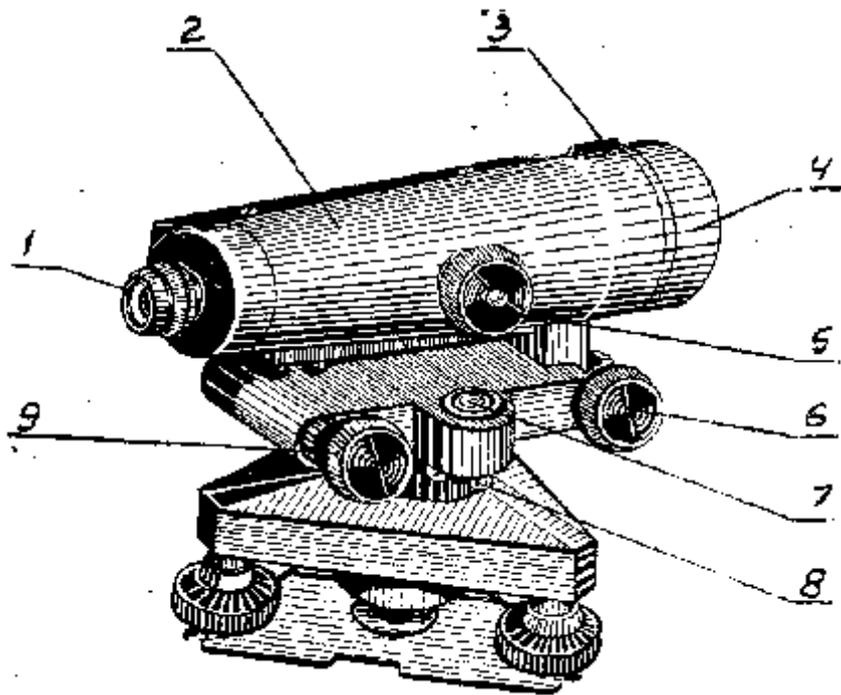
360°

16 (5).

() 13

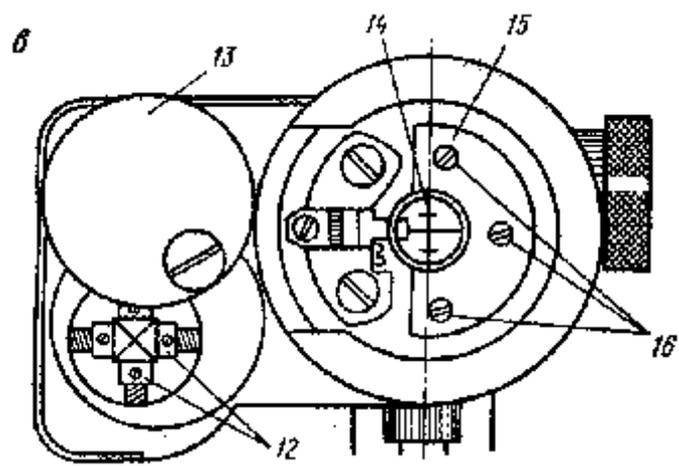
15,

14,



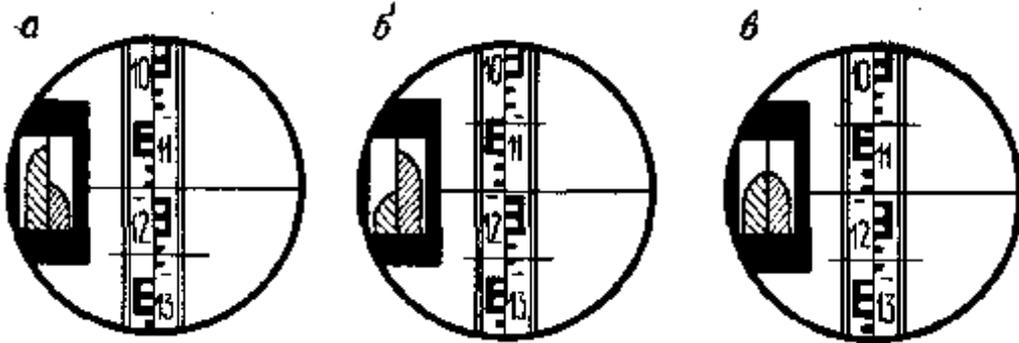
5 - -3 (-
): 1 - , 2 - , 3 - , 4 - , 5 - , 6 - ,
 7 - , 8 - , 9 - , 10 - ,
 , 11 - , 12 - , 13 - (), 14 -
 , 15 - , 16 - .

 : , ,
 ; 7, ,
 ; 9; 10; 6.
 8 ; 2 ()
 6), 1 .



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

5 (7).



7- - (,) -3 ()

2.5

1. (5) 7. 14
2. 1.
3. 3, 10, 6
10.
4. 5.
5. 9. ,
(7).

2.6

1. ()
180.
8 , -
180 - .
2. 20 -
25 - : 12

(5),

3,

5 (6).

3.

50-75

(1 2).

1,

)

b₁

1

i₁(

2.

i₂ b₂.

«i»

:

i = ,

i₁ i₂-

1 2, ;

b₁ b₂ -

, ;

d -

1 2, ;

-206265 -

«i»

5.

«i»

10.

«i»

10,

:

:

«i»

(7 ,).

1 (6)

1,

(7).

, «i» 10. ,

1 (6)

4

: :
:
:

- 1.
- 2.
- 3.

- ;
- ;
- ()
; ;
- ;
- ;
().

(.17).

(5) (6)

(7) (8) . 4 .
 $2 = 1 + h.$

, ... $i =$,

$$h = dtg\gamma.$$

h

-

$$\pm 0,04D, \quad D -$$

(. 18)
(1) (2)

(3) (4)
(1) - (2) (3) - (4)

(5) (6). 1

(2) - (4) = (8).
(7) (8) (9)

: (1) - (3) = (7)

(7) (8) (9) 1

() ,

. 15.

(. 19).

$$f_k = \sum_{i=1}^n h_i$$

$$f_k = \sum_{i=1}^n h_i - (H_k - H_k)$$

$$f_{k_{max}} = \pm 50\sqrt{L} \text{ (MM)}$$

:

:

:

- 1.
- 2.
- 3.
- 4. 40 40 .

.

».

«

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,

:

1 : 2000,

1 : 100.

§ 1.

- 1. (.). 2
1 : 1000,
 - 2. , 0 +20 +31 2 2.
31-20, 11 .
 - 3. +40 +31 9 .
3 « »
 - 4. 1 : 100 , .
 - 5. 6 7 124,69 . 5 .
» 110,00 ,
6 «
- : « », « » . .

§ 2.

- 1. .

_____ .
 _____ , _____ :

) 1 +0,05 .;

) 100 (i = 0), 1
 i = -0,004.

2. 4 « ».
 4 , 4,
 () .

3.
 : $h = i * d (i - , d -)$;
 = $-1 + id$.

: $2 = 1 + id = 126,90 - 100 * 0,004 = 126,50$.
 1 2 :

$1+ = 126,90 + (- 0,004 * 30) = 126,78$.

$1^{+62} = 126,90 + (- 0,004 * 62) = 126,65$. . .

5 « ».

4.
 5. (,)

h = . - .
 (.) .

6. .

- 1.
- 2.
- 3.

5-6

: , , .
: , ,
:

- 1.
- 2.
- 3.
- 4.

Sokkia 530RK

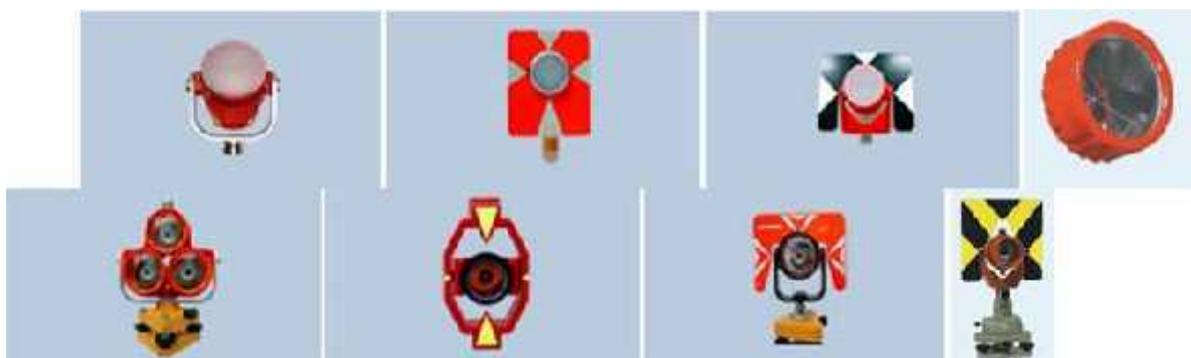
(. 6.26).

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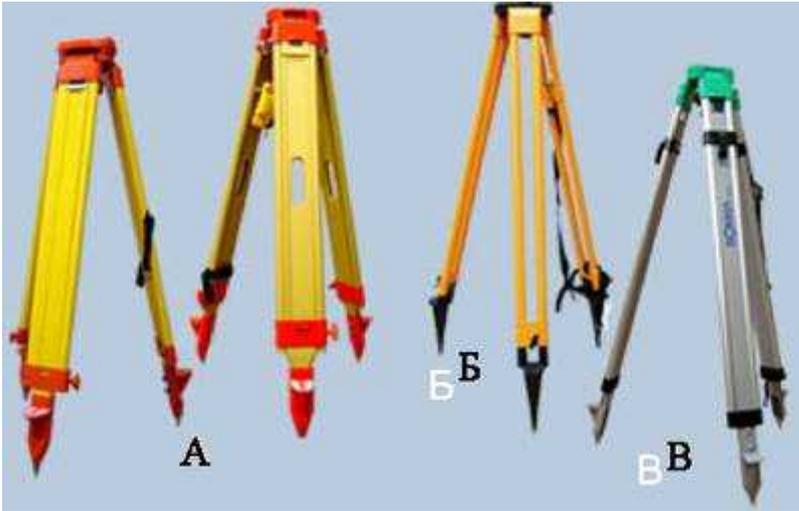
. 6.26.

(. 6.27)



. 6.27.

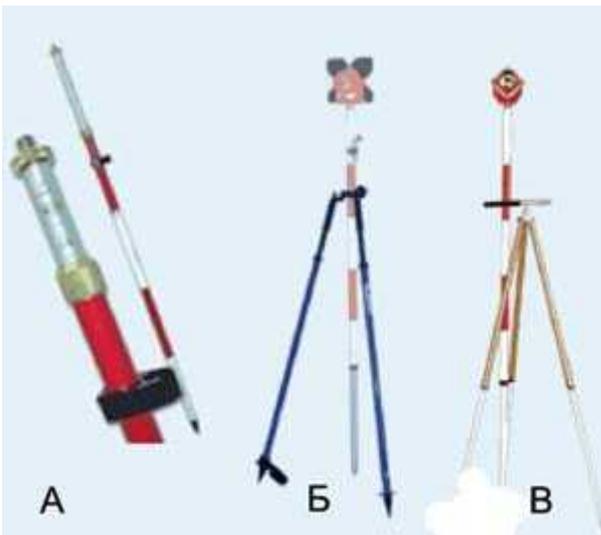
_____ , _____ , _____ (.6.28).
(_____ , _____), (_____ , _____).



6.28. _____ :

- _____ ; - _____ ; - _____

_____ (.6.29).



.6.29. _____ , _____ :

- _____ ; - _____ ; - _____

1,0 ; 1,5 ; 2,0 ; 2,6 ; 3,6 ; 4,6 .

(: ,), (.

_____ , _____

_____.

(_____) : _____

1. _____ (_____ , _____) .

2. _____ .

3. _____ (_____) , _____ .

4. _____ .

5. _____ , _____ .

6. _____ (_____) .

7. _____ (_____) .

8. _____ .

9. _____ (_____) .

10. _____ 1-9. _____ .

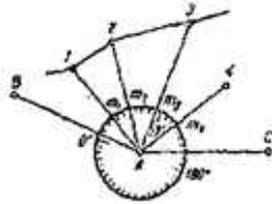


Рис. 50 Съёмка подробностей

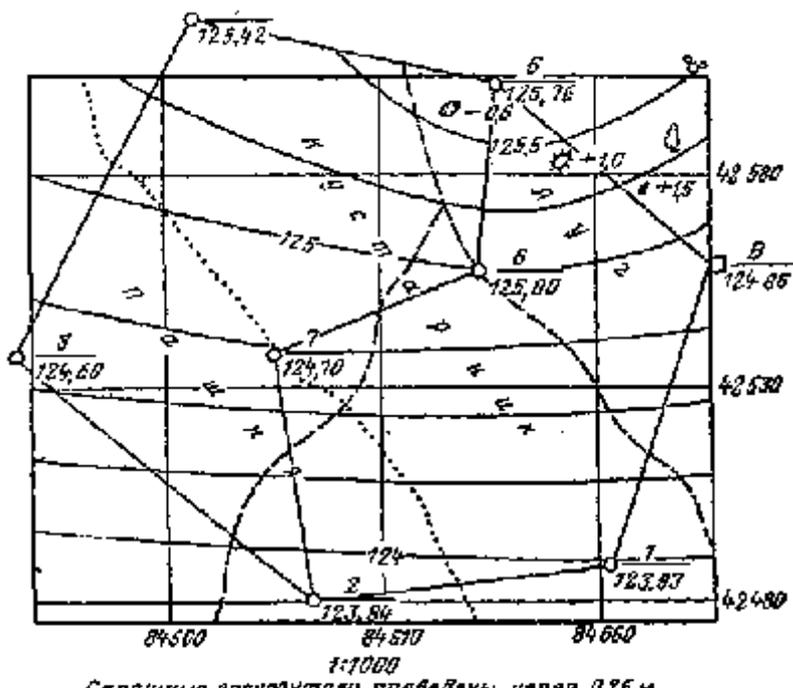
[Redacted]
[Redacted]
[Redacted] ([Redacted]). [Redacted] ([Redacted] 1, 2, 3,4).

[Redacted]
[Redacted]

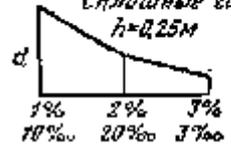
1, m2 = 41°20' « » ml = 30°
2, m3 = 89°40'

..

[Redacted]
[Redacted] : = [Redacted] = - [Redacted] = - [Redacted]



Сплошные горизонталы проведены через 0,25 м
 $h=0,25\text{ м}$



, :

$$h1 = 0.35 + 0.5 = 0.85$$

$$h2 = 0.23 + 0.00 = 0.23$$

$$h3 = 0.12 b \dots$$

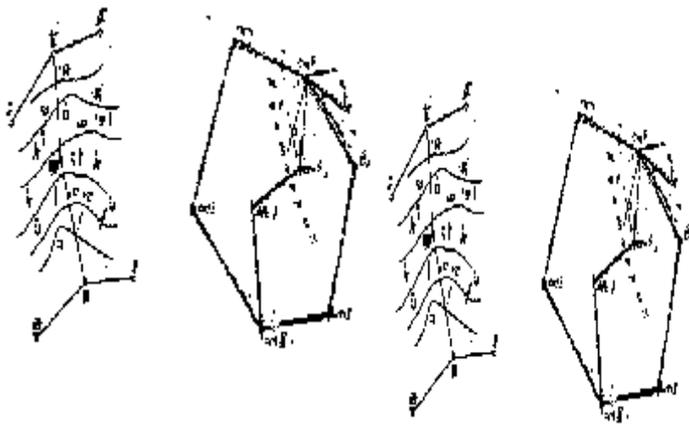
:

$$d1 = 39.7 + 0/01 = 39.71 \dots$$

$$d2 = 18.7 + 0.2 = 18.9 \dots$$

$$d3 = 26.9 \dots$$

:



:

:

:

- 5.
- 6.
- 7.
- 8.
- 9.

:

[2] .10-11, [1] .16-17, [4] .3-4, [6] .15,16, 18,19

1.

,

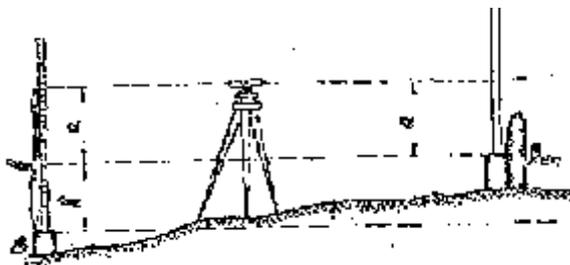
().

= +

= -

,

(), ().

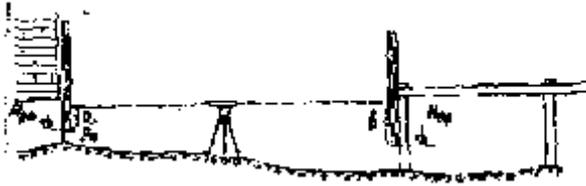


. 39

:

$$\begin{aligned} &= 1423 (\quad). & & = 150,492 (\quad). & & = 150,940 (\quad). \\ & & & & & = 150,452 + 1,423 = 151,875 (\quad) \\ & & & = 151,875 - 150,940 = 0,935 (\quad) = 935 (\quad). \end{aligned}$$

0935 (\quad).



. 40

2.

(\quad \quad)

(3: 4: 5).

:

-30

()

$35^{\circ} 15'$

()

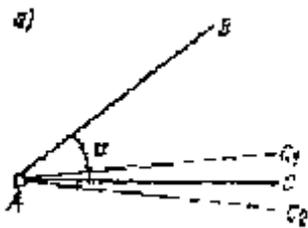
90° ..

$$35^{\circ} 15' + 90^{\circ} = 125^{\circ} 15'$$

90°

$125^{\circ} 15'$

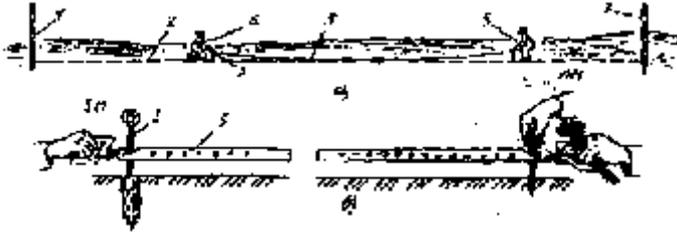
- ()
2. $C_{1, 2}$



3.

1,

.7.



. 42

) ;5- ;4- ;6- (); 1,7 - ;2- ;3-
), lk, lt, 1 (, 7.

$$l = L_n +$$

L - ();

- , ;

n-

:

$$l_t = L(t-t_0),$$

: -

t - ;

t₀ - ;

L - .

$$l = 2 d \sin^2 \theta / 2$$

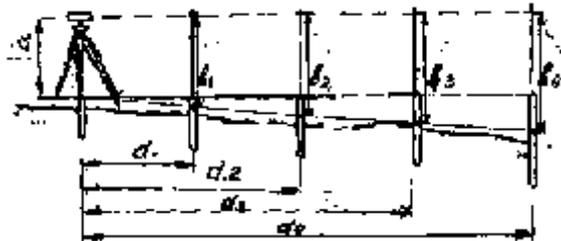
d - ;

= .

1 (1).

4.

i d, d, 1,2,3,4 d
d_b ().



:

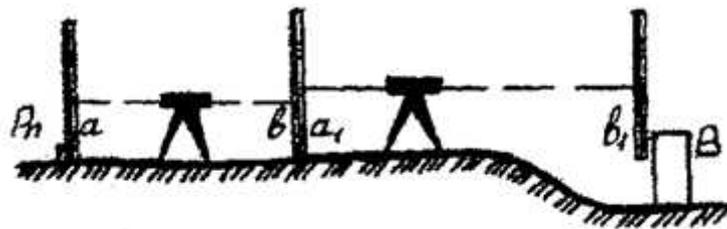
$$1 = + i d_1 ;$$

$$2 = a + i d_2 ;$$

$$3 = + i d_3 ;$$

$$4 = a + i d_4$$

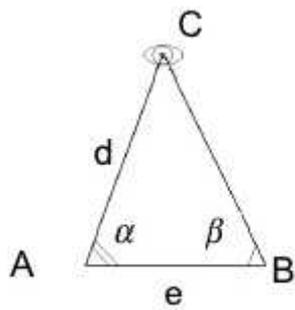
$$d_2 = 2 d_1 ; d_3 = 3 d_1 ; d_4 = 4 d_1 .$$



. 44

$$= + - + 1 - 1$$

:
 :
 :
 - ;
 - .



- 1.
- 2.
- 3.
- 4.

$$\begin{aligned}
 & \angle C = 180^\circ - \alpha - \beta; \sin C = \sin(180^\circ - \alpha - \beta) = \sin(\alpha + \beta) \\
 & \frac{AC}{\sin B} = \frac{AB}{\sin C}, AC = d, AB = c, \angle B = \beta, \\
 & d = \frac{c \sin \beta}{\sin(\alpha + \beta)}.
 \end{aligned}$$

5.