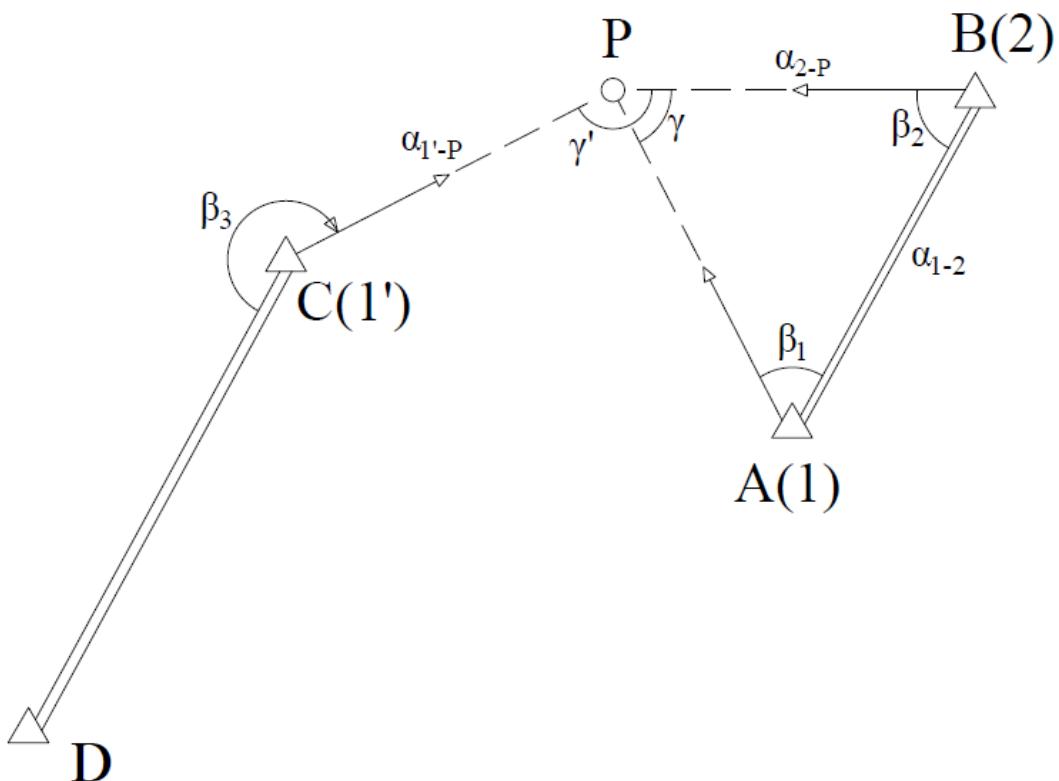


Amaliy ish №1

Mavzu: Bir yo'nalishli to'g'ri kesishtirish



1-rasm.

Poligonometrik C,D yo'lni uzoqdagi A va B triangulyatsiya punktlariga bog'lash talab qilinsin. Bog'lash ikkta (I-II) usulda bajariladi – Yung va Gauss formulalar orqali.

I usul – Yung formulasi

- 1-jadvalni toldiramiz (belgilangan variant boyicha A, B, C nuqtalarning x-koordinatalarini 2 ustunga kochiramiz, y-koordintalarini 3 ustunga kochiramiz; 4 ustunga β_1 va β_2 burchaklarini kochiramiz)

1 – jadval.

1	2	3	4	5
Nuqtaning nomi	Nuqtalarning x koordinatasi	Nuqtalarning y koordinatasi	β_1	$\operatorname{ctg} \beta_1$
			β_2	$\operatorname{ctg} \beta_2$
			γ	$\operatorname{ctg} \beta_1 + \operatorname{ctg} \beta_2$
A (1)				
B (2)				
C (3)				

2. 4 ustunga (γ) burchakni berilgan formula orqali topib yo'zamiz
 $(\gamma) = 180^\circ - \beta_1 - \beta_2$

3. 5 ustunga berilgan formula orqali natijani yo'zamiz

$$\operatorname{ctg} \beta_1 = \frac{1}{\operatorname{tg} \beta_1}$$

$$\operatorname{ctg} \beta_2 = \frac{1}{\operatorname{tg} \beta_2}$$

4. Yung formulasidan foydalanib P nuxtaning x va y koordinatalari hisoblanadi:

$$x_P = \frac{x_1 \operatorname{ctg} \beta_2 + x_2 \operatorname{ctg} \beta_1 - y_1 + y_2}{\operatorname{ctg} \beta_1 + \operatorname{ctg} \beta_2}$$

$$y_P = \frac{y_1 \operatorname{ctg} \beta_2 + y_2 \operatorname{ctg} \beta_1 + x_1 - x_2}{\operatorname{ctg} \beta_1 + \operatorname{ctg} \beta_2}$$

II usul – Gauss formulasi.

2 – jadval.

1	2	3	4	5	6
Nuqtaning nomi	α_{2-1}	$\alpha_{1'-D}$	Nuqtalarning x koordinatasi	1'	$\operatorname{ctg} \alpha_{1'-P}$
	β_2	β_3		2	$\operatorname{ctg} \alpha_{2-P}$
	α_{2-P}	$\alpha_{1'-P}$		D	$\operatorname{ctg} \alpha_{1'-P} - \operatorname{ctg} \alpha_{2-P}$
C (1')					
B (2)					
P (3)					

5. α_{2-1} direksion burchak 1(A) va 2 (B) nuqtalarning koordinatalari asosida teskari geodezik misol yordamida topamiz:

$$tgr_{2-1} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\alpha_{2-1} = \operatorname{arctg} r_{2-1} \pm 0^\circ; 90^\circ; 180^\circ; 270^\circ$$

6. Shunda α_{2-P} va $\alpha_{1'-P}$ direksion burchaklar berilgan formula orqali topiladi

$$\alpha_{2-P} = \alpha_{2-1} + \beta_2$$

$$\alpha_{1'-P} = \alpha_{1'-D} + \beta_3$$

7. Gauss formulasidan foydalanib P nuxtaning x va y koordinatali hisoblanadi:

$$x_P = \frac{x_1 \operatorname{tg} \alpha_{1'-P} - x_2 \operatorname{tg} \alpha_{2-P} + y_2 - y_1}{\operatorname{tg} \alpha_{1'-P} - \operatorname{tg} \alpha_{2-P}}$$

$$y_P = \frac{y_1 \operatorname{ctg} \alpha_{1'-P} - y_2 \operatorname{ctg} \alpha_{2-P} - x_1' + x_2}{\operatorname{ctg} \alpha_{1'-P} - \operatorname{ctg} \alpha_{2-P}}$$

8. Yung va Gauss formulasidan foydalanib P nuqtaning topilgan x va y koordinatalari teng bolish kerak.

Aniqlikni baholash

Aniqlanayotgan nuqtaning o'rta kvadratik xatosi A va B nuqtalarning asosida topiladi. Bu erda d_{ab} – kesishtirish bazisi.

$m''_\beta = 2'' - o'lchangan burchakning o'rta kvadratik xatosi, \rho = 206265''$

I Kombinatsiya A nuqtaning yo'rdamida

$$M_P = \frac{m''_\beta}{\rho''} \times \sin \gamma \sqrt{d_a^2 + d_b^2}$$

$$M'_P = \frac{m''_\beta}{\rho''} \times \sin \gamma \sqrt{d_{1-P}^2 + d_{2-P}^2}$$

$$d_{1-P} = \sqrt{(x_P - x_1)^2 + (y_P - y_1)^2}$$

$$d_{2-P} = \sqrt{(x_P - x_2)^2 + (y_P - y_2)^2}$$

II Kombinatsiya B nuqtaning yo'rdamida

$$M''_P = \frac{m''_\beta}{\rho''} \times \sin \gamma' \sqrt{d_{1'-P}^2 + d_{2-P}^2}$$

$$d_{1'-P} = \sqrt{(x_P - x_{1'})^2 + (y_P - y_{1'})^2}$$

$$d_{2-P} = \sqrt{(x_P - x_2)^2 + (y_P - y_2)^2}$$

P punkt holatining o'rta kvadratik xatosi:

$$M = \sqrt{M'^2_P + M''^2_P}$$

Jadval

№	Nuqtalarning koordinatalari, m						O'lchangan burchaklar											
	A		B		C		β₁			β₂			β₃			α _{C-D}		
	x ₁	y ₁	x ₂	y ₂	x' ₁	y' ₁	gradus	daqiqa	soniya	gradus	daqiqa	soniya	gradus	daqiqa	soniya	gradus	daqiqa	soniya
1	5863,21	5659,98	5378,07	6980,82	6592,49	7628,86	49	44	38	54	15	20	133	15	30	127	49	10
2	3705,05	3624,59	3052,39	5335,92	4551,26	5692,17	49	15	47	35	27	56	132	3	43	121	13	43
3	5144,83	2384,24	4467,76	4172,77	6065,03	4801,79	40	37	44	52	1	39	108	40	12	139	9	58
4	6593,66	4958,43	5834,62	6727,74	7202,89	7123,74	42	32	20	36	5	12	131	20	37	126	44	22
5	6357,63	4206,87	5743,75	5646,05	7206,42	6303,42	48	5	31	50	25	21	123	37	37	138	29	43
6	4592,51	3509,52	3829,93	5050,57	5162,01	5917,03	50	21	24	44	18	30	137	21	20	129	11	25
7	5772,91	1704,33	5054,19	3260,29	6432,70	3548,06	37	31	45	46	32	53	111	19	18	127	3	1
8	6357,63	4206,87	5743,75	5646,05	7206,47	6303,42	51	57	35	43	5	50	120	8	41	133	53	25
9	5713,24	2838,99	5245,21	4617,52	6778,76	5102,21	43	25	25	50	22	22	106	15	41	143	3	13
10	5424,91	2329,20	4592,92	4023,53	6109,22	4666,56	43	13	47	41	15	48	131	8	6	123	20	57
11	5771,35	2595,82	5274,55	3773,79	6764,19	4279,45	64	15	54	42	11	19	122	27	27	125	56	9
12	3585,33	5624,75	2980,26	7026,38	4376,67	7651,45	63	36	46	40	16	3	125	31	7	138	20	53
13	3426,96	2580,48	2891,87	3950,27	4459,55	4584,39	55	19	41	51	58	30	120	47	15	129	39	54
14	6280,30	5329,21	5915,81	6779,12	7238,04	7453,73	54	13	55	45	29	36	124	42	16	133	56	3
15	3359,49	4763,10	2682,26	6153,93	4186,72	6483,23	61	30	8	38	41	51	125	54	46	128	32	32
16	3191,27	4437,46	2373,96	5967,97	3691,29	6509,88	48	34	51	35	57	29	128	28	3	134	16	3
17	4001,01	1594,43	3514,84	3163,00	4891,18	3868,79	40	42	12	62	21	33	124	40	8	127	15	55
18	3866,80	2107,79	3299,39	3551,53	4705,33	4255,05	55	36	54	40	31	44	125	18	9	133	4	6
19	5696,39	2130,88	4926,34	3711,22	6130,19	4101,96	46	19	42	37	36	7	148	43	44	117	46	10
20	3926,49	3832,34	3310,24	5029,06	4471,53	5631,29	57	32	30	40	27	40	152	22	31	112	6	46
21	3030,92	5337,12	2223,73	6547,53	3790,68	7025,01	63	28	31	32	30	25	116	24	8	133	25	43
22	5069,27	1641,49	4381,10	3115,93	5818,07	3787,99	43	15	15	59	50	54	121	52	30	127	9	13
23	4710,07	2505,16	3894,74	4136,12	5467,69	4533,86	42	27	22	46	19	38	105	48	48	136	38	34
24	3135,42	3167,46	2676,48	4804,22	3833,16	5438,98	43	59	15	50	30	14	124	46	34	141	26	49
25	6332,20	4523,26	5510,60	5997,23	6756,25	6729,90	44	42	10	38	1	26	131	39	53	131	31	49