

BAB IV
HASIL PENELITIAN DAN ANALISIS TENTANG ARAH KIBLAT
MASJID DENGAN MENGGUNAKAN METODE BAYANG BAYANG
KIBLAT

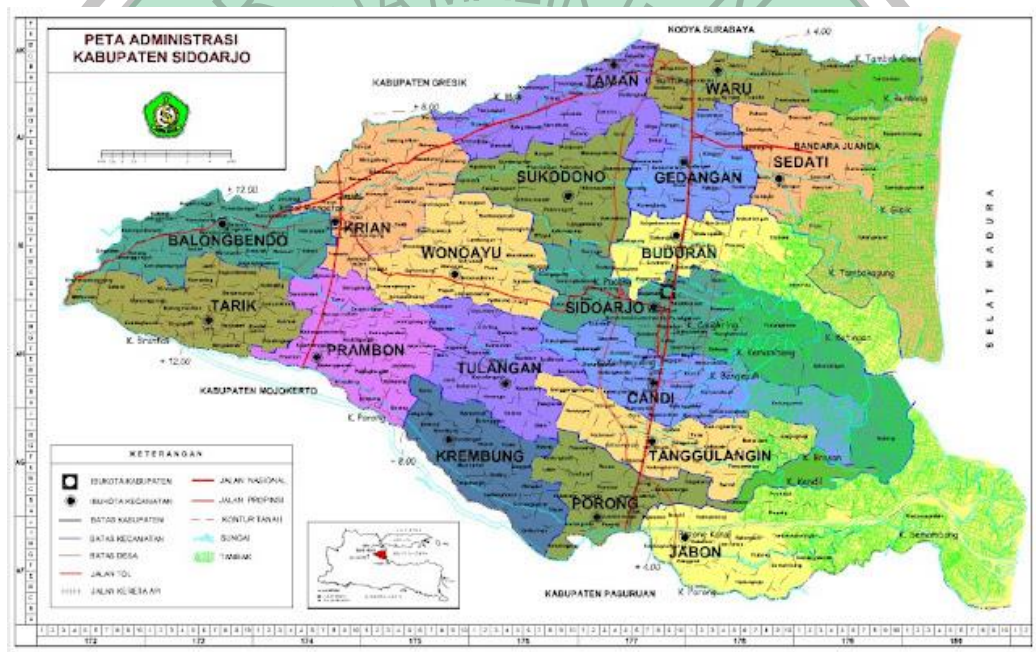
A. Paparan Data Kecamatan Wonoayu

Wonoayu menurut bahasa jawa terdiri dari dua suku kata yakni *Wono* : Alas , *Ayu* : Indah , Cantik . Maka ketika dua kata ini digabung maka berarti Wonoayu : Alas yang indah atau Cantik. Wonoayu merupakan salah satu kecamatan yang terletak di bawah naungan pemerintah kabupaten Sidoarjo. Letak geografis dari Kecamatan Wonoayu sangat strategis. ini karena kecamatan Wonoayu terletak di tengah - tengah kabupaten Sidoarjo.

Letak Wonoayu secara geografis atau Batas Wilayah Secara administratif, Kecamatan Wonoayu berbatasan dengan :

1. Sebelah utara : Kecamatan Sukodono
2. Sebelah timur : Kecamatan Sidoarjo
3. Sebelah selatan : Kecamatan Tulangan dan kecamatan Prambon
4. Sebelah barat : Kecamatan Krian

Gambar 4.1



Masyarakat di Kecamatan Wonoayu Kabupaten Sidoarjo mayoritas beragama Islam. Berikut ini penduduk Kecamatan Wonoayu Kabupaten Sidoarjo berdasarkan agama:

Tabel 4.4

Persentase Pemeluk Agama Menurut

Desa/Kelurahan

Tahun 2010

No	Desa/Kelurahan	Islam	Kristen/Katolik	Hindu/Budha	Lain-Lain
1	Simoketawang	1665	-	-	-
2	Popoh	2764	-	-	-
3	Jimbaran wetan	1302	-	-	-
4	Ketimang	3289	10	3	-
5	Pilang	6014	11	2	-
6	Sumberrejo	3483	-	-	-
7	Mojoarangagung	742	-	-	-
8	Wonokasian	5301	-	-	-
9	Ploso	3545	-	-	-
10	Jimbaran kulon	1483	-	-	-
11	Wonoayu	4163	6	2	-
12	Semambung	3873	-	-	-
13	Simo angin angin	2865	-	-	-
14	Tanggul	4529	5	-	-
15	Wonokalang	2942	3	-	-

16	Pagemgumbuk	3142	-	-	-
17	Plaosan	3083	7	-	-
18	Mulyodadi	2277	-	-	-
19	Lambangan	3281	-	-	-
20	Sawocangkring	4392	-	-	-
21	Becironggor	4291	-	-	-
22	Karangpuri	4173	-	-	-
23	Candinegoro	3582	-	-	-
Jumlah		76281	44	7	-

Seperti yang telah disebutkan di atas bahwa masyarakat di Kecamatan Wonoayu Kabupaten Sidoarjo adalah mayoritas beragama Islam. Kondisi seperti ini didukung pula dengan adanya beberapa lembaga pendidikan agama seperti Pondok Pesantren, TPQ/TPA, Remaja Masjid (Remas), Jama'ah Muslimah dan Perkumpulan lainnya yang bertujuan mengembangkan ajaran Islam. Terdapat beberapa perkumpulan yang di dalamnya dilaksanakan kegiatan pengajian seperti: Majelis Ta'lim, Jama'ah Tahlil, Jama'ah Khatmil Qur'an, Jama'ah Maulid, Jama'ah Rathib dan lain sebagainya yang dilakukan dengan tempat dan waktu yang bervariasi. Ada yang dilakukan seminggu sekali, sebulan sekali dan ada yang sifatnya insidental.

Sedangkan banyaknya tempat ibadah di Kecamatan Wonoayu Kabupaten Sidoarjo dari masing masing Agama sebagai berikut :

Tabel 4.5
 Banyaknya Tempat Ibadah Menurut
 Desa/Kelurahan
 Tahun 2010

No	Desa/Kelurahan	Masjid	Mushola/Langgar	Gereja	Pura/Vihara
1	Simoketawang	3	6	-	-
2	Popoh	2	10	-	-
3	Jimbaran wetan	2	5	-	-
4	Ketimang	2	19	-	-
5	Pilang	2	18	-	-
6	Sumberrejo	3	13	-	-
7	Mojorangagung	2	3	-	-
8	Wonokasian	4	24	-	-
9	Ploso	1	15	-	-
10	Jimbaran kulon	1	4	-	-
11	Wonoayu	2	11	-	-
12	Semambung	2	16	-	-
13	Simo angin angin	2	12	-	-
14	Tanggul	1	19	-	-
15	Wonokalang	3	8	-	-
16	Pagerngumbuk	3	15	-	-

17	Plaosan	3	12	-	-
18	Mulyodadi	2	9	-	-
19	Lambangan	2	9	-	-
20	Sawocangkring	4	17	-	-
21	Becirongengor	2	18	-	-
22	Karangpuri	4	16	-	-
23	Candinegoro	2	15	-	-
Jumlah		54	294		

B. Analisis Tentang Arah Kiblat Masjid

Untuk mengetahui arah kiblat maka harus ditentukan berapa besar lintang dan bujur tempat pada masing-masing tempat yang akan diteliti. Dalam hal ini peneliti menggunakan bantuan software *Google Eart* untuk mengetahui lintang dan bujur tempat.

Untuk mempermudah dalam perhitungan posisi wilayah masing-masing masjid diteliti, maka lintang tempat yang biasanya ditandai dengan simbol ϕ (phi) dan bujur tempat yang biasanya ditandai dengan simbol λ (lamda).

Tabel 4.6

Lintang dan Bujur tempat Masjid di Kecamatan Wonoayu

No	Nama Desa	Nama Masjid	Lintang (ϕ)	Bujur (λ)
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1	Simoketawang	Masjid Baitul Muttaqin	7° 27' 18,88"	112° 38' 65,59"
2	Popoh	Masjid Baitur Rohman	7° 27' 01,17"	112° 37' 59,95"
3	Jimbaran wetan	Masjid Baitul Iksan	7° 27' 07,91"	112° 38' 33, 01"
4	Ketimang	Masjid Baitus Salam	7° 26' 32,89"	112° 38' 29,14"
5	Pilang	Masjid An-Nur	7° 27' 19,02"	112° 39' 34"
6	Sumberrejo	Masjid Khusnul Khotimah	7° 26' 53,44"	112° 39' 43,09"
7	Mojorangagung	Masjid Baitus Salam	7° 26' 37,00"	112° 39' 46,67"
8	Wonokasian	Masjid Subulum Salam	7° 26' 13,37"	112° 39' 23,02"
9	Ploso	Masjid Baitur Rohman	7° 29' 19,02"	112° 39' 34"
10	Jimbaran kulon	Masjid Al Mubarakah	7° 26' 36,78"	112° 38' 24,81"
11	Wonoayu	Masjid Maslahul Huda	7° 26' 29,73"	112° 37' 59,53"
12	Semambung	Masjid Baitul Muttaqin	7° 26' 37,00"	112° 37' 29,56"

13	Simo angin angin	Masjid Darul Hikmah	7° 26' 38,12"	112° 37' 07,76"
14	Tanggul	Masjid Baitur Rohman	7° 26' 34,16"	112° 36' 28,35"
15	Wonokalang	Masjid Nurul Huda	7° 25' 50,71"	112° 37' 17,64"
16	Pagerngumbuk	Masjid Baitul Amin	7° 25' 50,49"	112° 37' 39,46"
17	Plaosan	Masjid Bahrul Huda	7° 25' 29,13"	112° 38' 65,59"
18	Mulyodadi	Masjid Baitur Rohman	7° 26' 05,70"	112° 38' 08,13"
19	Lambangan	Masjid Nurul Yakin	7° 25' 43,08"	112° 38' 30,38"
20	Sawocangkring	Masjid Al Kaffi	7° 25' 30,07"	112° 39' 20,99"
21	Becirongengor	Masjid Roudhatul Jannah	7° 25' 14,75"	112° 38' 43,08"
22	Karangpuri	Masjid Darul Hikmah	7° 24' 47,55"	112° 38' 04,39"
23	Candinegoro	Masjid Maslakul Mujahidin	7° 24' 53,60"	112° 37' 43,04"

Apabila posisi lintang dan bujur tempat wilayah yang diteliti sudah diketahui maka, maka sesuai dengan penelitian ini, proses menghitung dilakukan dengan menggunakan rumus sinus-cosinus dan kemudian menggunakan rumus bayang bayang kiblat untuk mengetahui jam berapa bayang kiblat terjadi. Menentukan arah kiblat masjid sebagai berikut:

1. Masjid Baitul Mutaqien Di Desa Semambung

Diketahui :

Lintang tempat masjid (ϕ) = $07^{\circ} 26' 50,19''$

Bujur tempat masjid (λ) = $112^{\circ} 37' 24,14''$

Lintang Makkah (ϕM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 20 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 14' 16''$

Deklinasi Matahari ; $-8^{\circ} 40' 34''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \phi A = 90^{\circ} - 07^{\circ} 26' 50,19'' = 82^{\circ} 33' 9,81''$$

$$b. 90^{\circ} - \phi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \lambda A - \lambda m = 112^{\circ} 37' 24,14'' - 39^{\circ} 50' = 72^{\circ} 47' 24,14''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

Sin c

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 33' 9,81'' - \text{Cos } 82^{\circ} 33' 9,81'' \times$$

$$\text{Cotan } 72^{\circ} 47' 24,14''$$

$$\sin 72^{\circ}47'24,14''$$

$$= 69^{\circ}50'52,4'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (70^{\circ}0'22,51'')$$

$$= 90^{\circ} - 70^{\circ}0'22,51'' = 19^{\circ}59'37,49'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$(105^{\circ} - 112^{\circ}37'24,14'') : 15 = -0^{\circ}30'29,61''$$

Rumus Pembantu =

a. 90° - Deklinasi = $90^{\circ} - (-8^{\circ}40'34'') = 98^{\circ}40'34''$

b. 90° - Lintang Tempat = $90^{\circ} - 7^{\circ}26'50,19'' = 82^{\circ}33'9,81''$

A. $19^{\circ}59'37,49''$

Proses Penghitungan =

1. $\cotan P = \cos b \times \tan A$

$$\cotan P = \text{shift tan } (1/\cos 82^{\circ}33'9,81'' \times \tan 19^{\circ}59'37,49'')$$

$$P = -87^{\circ}17'59,85''$$

2. $\cos (CP) = \cotan a \times \tan b \times \cos P + P$

$$= \text{shift cos } ((1/\tan 98^{\circ}40'34'') \times \tan 82^{\circ}33'9,81'' \times \cos -$$

$$87^{\circ}17'59,85'') + -87^{\circ}17'59,85''$$

$$= 93^{\circ}9'8,57'' + -87^{\circ}17'59,85''$$

$$C = 5^{\circ}51'59,85''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (KWD)$

$$C/15 = 5^{\circ}51'59,85'' : 15 \qquad 0^{\circ}24'10,02''$$

$$MP = 12 - (0^{\circ}14'16'') \qquad 11^{\circ}45'30''$$

$$\text{KWD} = (105^\circ - 112^\circ 37' 24,14'')/15 \quad -0^\circ 30' 34,2''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \quad 11^\circ 38' 38,97''$$

2. Masjid Baitur Rohman Di Desa Popoh

Diketahui :

$$\text{Lintang tempat masjid } (\varphi) = 07^\circ 27' 01,177''$$

$$\text{Bujur tempat masjid } (\lambda) = 112^\circ 37' 59,53''$$

$$\text{Lintang Makkah } (\varphi \text{ M}) : 21^\circ 25' \text{ LU}$$

$$\text{Bujur Makkah } (\lambda \text{ M}) : 39^\circ 50' \text{ BT}$$

Pada Tanggal 17 Oktober 2012

$$\text{Eq. Of Time (e) : } 0^\circ 14' 42''$$

$$\text{Deklinasi Matahari ; } -9^\circ 24' 36''$$

Dari data di atas dapat diketahui:

$$\text{a. } 90^\circ - \varphi \text{ A} = 90^\circ - 07^\circ 27' 01,177'' = 82^\circ 32' 58,83''$$

$$\text{b. } 90^\circ - \varphi \text{ m} = 90^\circ - 21^\circ 25' = 68^\circ 35'$$

$$\text{c. } \lambda \text{ A} - \lambda \text{ m} = 112^\circ 36' - 39^\circ 50' = 72^\circ 47' 59,53''$$

Rumus:

$$\text{Cotan Q} = \frac{\text{Cotan b} \times \text{Sin a} - \text{Cos a} \times \text{Cotan c}}$$

Sin c

$$= \frac{\text{Cotan } 68^\circ 35' \times \text{Sin } 82^\circ 32' 58,83'' - \text{Cos } 82^\circ 32' 58,83'' \times$$

$$\text{Cotan } 72^\circ 47' 59,53''$$

$$\text{Sin } 72^\circ 47' 59,53''$$

$$= 69^{\circ}50'50,74'' \text{ (dari titik B – U)}$$

$$= 90^{\circ} - (69^{\circ}50'50,74'')$$

$$= 90^{\circ} - 69^{\circ}50'50,74'' = 20^{\circ} 9' 9,26'' \text{ (dari titik U – B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$(105^{\circ} - 112^{\circ}37'59,53'') : 15 = -0^{\circ}30'31,97''$$

Rumus Pembantu =

$$\text{a. } 90^{\circ} - \text{Deklinasi} = 90^{\circ} - (-9^{\circ}24'36'') = 99^{\circ}24'36''$$

$$\text{b. } 90^{\circ} - \text{Lintang Tempat} = 90^{\circ} - 7^{\circ}27'01,17'' = 82^{\circ}32'58,83''$$

$$\text{A. } 20^{\circ} 9' 9,26''$$

Proses Penghitungan =

$$1) \text{ Cotan P} = \text{Cos b} \times \text{Tan A}$$

$$\text{Cotan P} = \text{shift tan} (1/\text{Cos } 82^{\circ}32'58,83'' \times \text{Tan } 20^{\circ} 9' 9,26'')$$

$$\text{P} = -87^{\circ}16'32,04''$$

$$2) \text{ Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + \text{P}$$

$$= \text{shift cos} ((1/\text{tan } 99^{\circ}24'36'') \times \text{tan } 82^{\circ}32'58,83'' \times \text{cos } -87^{\circ}16'32,04'')$$

$$= 93^{\circ}27'12,67'' + -87^{\circ}16'32,04''$$

$$= 6^{\circ}10'40,63''$$

Langkah Berikutnya adalah = C/15 + (12-e) + (KWD)

$$\text{C}/15 = 6^{\circ}10'40,63'' : 15 \qquad 0^{\circ}24'42,71''$$

$$\text{MP} = 12 - (0^{\circ}14'42'') \qquad 12^{\circ}14'42''$$

$$\text{KWD} = (105^{\circ} - 112^{\circ}37'59,53'') / 15 \qquad -0^{\circ}30'31,97''$$

Bayang bayang kiblat (WIB) $12^{\circ}8'52,74''$

3. Masjid Baitul Iksan Di Desa Jimbaran Wetan

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 27' 07,91''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 33,01''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 16 Oktober

Eq. Of Time (e) : $0^{\circ}14'30''$

Deklinasi Matahari ; $-9^{\circ} 02'39''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 27' 07,91'' = 82^{\circ}32'52,09''$$

$$b. 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ}25' = 68^{\circ}35'$$

$$c. \lambda A - \lambda m = 112^{\circ}38'33,01'' - 39^{\circ}50' = 72^{\circ}48'33,01''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ}35' \times \text{Sin } 82^{\circ}32'52,09'' - \text{Cos } 82^{\circ}32'52,09'' \times$$

$$\text{Cotan } 72^{\circ}48'33,01''$$

$$\text{Sin } 72^{\circ}48'33,01''$$

$$= 69^{\circ}50'52,4'' \text{ (dari titik B - U)}$$

$$= 90^\circ - (69^\circ 50' 52,4'')$$

$$= 90^\circ - 69^\circ 50' 52,4'' = 20^\circ 9' 7,6'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$(105^\circ - 112^\circ 38' 33,01'') : 15 = -0^\circ 30' 34,2''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-9^\circ 02' 39'') = 99^\circ 2' 39''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 27' 07,91'' = 82^\circ 32' 52,09''$

A. $20^\circ 9' 7,6''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 32' 52,09'' \times \text{Tan } 20^\circ 9' 7,6'')$$

$$P = -87^\circ 16' 29,84''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos } ((1/\text{tan } 99^\circ 2' 39'') \times \text{tan } 82^\circ 32' 52,09'' \times \text{cos } -$$

$$87^\circ 16' 29,84'') + -87^\circ 16' 29,84''$$

$$= 93^\circ 19' 0,12'' + -87^\circ 16' 29,84''$$

$$C = 6^\circ 2' 30,28''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 2' 30,28'' : 15 \qquad 0^\circ 24' 10,02''$$

$$MP = 12 - (0^\circ 14' 30'') \qquad 11^\circ 45' 30''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 33,01'') / 15 \qquad -0^\circ 30' 34,2''$$

_____ +

Bayang bayang kiblat (WIB) $11^{\circ}39'06''$

4. Masjid Baitus Salam Di Desa Ketimang

Diketahui :

Lintang tempat masjid (ϕ) = $07^{\circ} 26' 36,61''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 43,01''$

Lintang Makkah (ϕM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 10 Oktober 2012

Eq. Of Time (e) : $0^{\circ}13'03''$

Deklinasi Matahari ; $-6^{\circ} 13'03''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \phi A = 90^{\circ} - 07^{\circ} 26' 36,61'' = 82^{\circ}33'23,39''$$

$$b. 90^{\circ} - \phi m = 90^{\circ} - 21^{\circ}25' = 68^{\circ}35'$$

$$c. \lambda A - \lambda m = 112^{\circ}38'43,01'' - 39^{\circ}50' = 72^{\circ}48'34,05''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ}35' \times \text{Sin } 82^{\circ}33'23,39'' - \text{Cos } 82^{\circ}33'23,39'' \times$$

$$\text{Cotan } 72^{\circ}48'34,05''$$

$$\text{Sin } 72^{\circ}48'34,05''$$

$$= 69^{\circ}50'42,46'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ}50'42,46'')$$

$$= 90^\circ - 69^\circ 50' 42,46'' = 20^\circ 9' 17,54'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempa / 15) :

$$(105^\circ - 112^\circ 38' 43,01'') : 15 = -0^\circ 30' 34,87''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-6^\circ 48' 25'') = 96^\circ 48' 25''$

b. $90^\circ - \text{Lintang Tempa} = 90^\circ - 7^\circ 26' 36,61'' = 82^\circ 33' 23,39''$

A. $20^\circ 9' 17,54''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan} (1/\text{Cos } 82^\circ 33' 23,39'' \times \text{Tan } 20^\circ 9' 17,54'')$$

$$P = -82^\circ 21' 59,79''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos} ((1/\text{tan } 96^\circ 48' 25'') \times \text{tan } 82^\circ 33' 23,39'' \times \text{cos } -82^\circ 21' 59,79'')$$

$$= 96^\circ 58' 14,49'' + -82^\circ 21' 59,79''$$

$$C = 14^\circ 36' 14,7''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 14^\circ 36' 14,7'' : 15 = 0^\circ 58' 24,98''$$

$$\text{MP} = 12 - (0^\circ 13' 03'') = 11^\circ 46' 57''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 43,01'') / 15 = -0^\circ 30' 34,87''$$

	+
Bayang bayang kiblat (WIB)	12°14'47,11''

5. Masjid An Nur Di Desa Pilang

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 27' 07,91''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 33,01''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 11 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 14' 30''$

Deklinasi Matahari ; $-9^{\circ} 02' 39''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 27' 07,91'' = 82^{\circ} 32' 52,09''$$

$$b. 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \lambda A - \lambda m = 112^{\circ} 38' 33,01'' - 39^{\circ} 50' = 72^{\circ} 48' 33,01''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 32' 52,09'' - \text{Cos } 82^{\circ} 32' 52,09'' \times$$

$$\text{Cotan } 72^{\circ} 48' 33,01''$$

$$\text{Sin } 72^{\circ} 48' 33,01''$$

$$= 69^{\circ} 50' 52,4'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 52,4'')$$

$$= 90^{\circ} - 69^{\circ} 50' 52,4'' = 20^{\circ} 9' 7,6'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$(105^\circ - 112^\circ 38' 33,01'') : 15 = -0^\circ 30' 34,2''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-9^\circ 02' 39'') = 99^\circ 2' 39''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 27' 07,91'' = 82^\circ 32' 52,09''$

A. $20^\circ 9' 7,6''$

Proses Penghitungan =

1) $\text{Cotan } P = \text{Cos } b \times \text{Tan } A$

$$\text{Cotan } P = \text{shift tan } (1/\text{Cos } 82^\circ 32' 52,09'' \times \text{Tan } 20^\circ 9' 7,6'')$$

$$P = -87^\circ 16' 29,84''$$

2) $\text{Cos } (CP) = \text{Cotan } a \times \text{Tan } b \times \text{Cos } P + P$

$$= \text{shift cos } ((1/\text{tan } 99^\circ 2' 39'') \times \text{tan } 82^\circ 32' 52,09'' \times \text{cos } -$$

$$87^\circ 16' 29,84'') + -87^\circ 16' 29,84''$$

$$= 93^\circ 19' 0,12'' + -87^\circ 16' 29,84''$$

$$C = 6^\circ 2' 30,28''$$

Langkah Berikutnya adalah $= C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 2' 30,28'' : 15 \qquad 0^\circ 24' 10,02''$$

$$\text{MP} = 12 - (0^\circ 14' 30'') \qquad 11^\circ 45' 30''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 33,01'') / 15 \qquad -0^\circ 30' 34,2''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad 11^\circ 39' 06''$$

6. Masjid Maslakul Huda Di Desa Wonoayu

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 26' 15,34''$

Bujur tempat masjid (λ) = $112^{\circ} 37' 15,91''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 13 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 13' 49''$

Deklinasi Matahari ; $-7^{\circ} 56' 49''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 26' 15,34'' = 82^{\circ} 33' 44,66''$$

$$b. 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \lambda A - \lambda m = 112^{\circ} 37' 15,91'' - 39^{\circ} 50' = 72^{\circ} 47' 15,91''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 33' 44,66'' - \text{Cos } 82^{\circ} 33' 44,66'' \times$$

$$\text{Cotan } 72^{\circ} 47' 15,91''$$

$$\text{Sin } 72^{\circ} 47' 15,91''$$

$$= 69^{\circ} 50' 36,8'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 36,8'')$$

$$= 90^\circ - 69^\circ 50' 36,8'' = 20^\circ 9' 23,2'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$(105^\circ - 112^\circ 37' 15,91'') : 15 = -0^\circ 30' 29,06''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-7^\circ 56' 02'') = 97^\circ 56' 2''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 26' 15,34'' = 82^\circ 33' 44,66''$

A. $20^\circ 9' 23,2''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan} (1/\text{Cos } 82^\circ 33' 44,66'' \times \text{Tan } 20^\circ 9' 23,2'')$$

$$P = -87^\circ 16' 46,64''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos} ((1/\text{tan } 97^\circ 56' 2'') \times \text{tan } 82^\circ 33' 44,66'' \times \text{cos } -$$

$$87^\circ 16' 46,64'') + -87^\circ 16' 46,64''$$

$$= 92^\circ 54' 15,56'' + -87^\circ 16' 46,64''$$

$$= 5^\circ 37' 28,92''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 5^\circ 37' 28,92'' : 15 = 0^\circ 22' 29,93''$$

$$\text{MP} = 12 - (0^\circ 13' 49'') = 11^\circ 46' 11''$$

$$\text{KWD} = (105^\circ - 112^\circ 37' 15,91'') / 15 = -0^\circ 30' 29,06''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} = 11^\circ 38' 11,87''$$

7. Masjid Al Mubarakah Jimbaran Kulon

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 26' 36,78''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 24,81''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 18 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 14' 54''$

Deklinasi Matahari ; $-9^{\circ} 46' 26''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 26' 36,78'' = 82^{\circ} 33' 23,22''$$

$$b. 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \lambda A - \lambda m = 112^{\circ} 38' 24,81'' - 39^{\circ} 50' = 72^{\circ} 48' 24,81''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 33' 23,22'' - \text{Cos } 82^{\circ} 33' 23,22'' \times$$

$$\text{Cotan } 72^{\circ} 48' 24,81''$$

$$\text{Sin } 72^{\circ} 48' 24,81''$$

$$= 69^{\circ} 50' 42,64'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 42,64'')$$

$$= 90^{\circ} - 69^{\circ} 50' 42,64'' = 20^{\circ} 9' 17,36'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$(105^\circ - 112^\circ 38' 24,81'') : 15 = -0^\circ 30' 33,65''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-9^\circ 46' 26'') = 99^\circ 46' 26''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 26' 36,78'' = 82^\circ 33' 23,22''$

A. $20^\circ 91' 17,36''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 33' 23,22'' \times \text{Tan } 20^\circ 91' 17,36'')$$

$$P = -87^\circ 4' 31,71''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos } ((1/\text{tan } 99^\circ 46' 26'') \times \text{tan } 82^\circ 33' 23,22'' \times \text{cos } -$$

$$87^\circ 4' 31,71'') + -87^\circ 4' 31,71''$$

$$= 93^\circ 51' 25,87'' + -87^\circ 16' 32,04''$$

$$C = 6^\circ 34' 53,83''$$

Langkah Berikutnya adalah $= C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 34' 53,83'' : 15 \qquad 0^\circ 26' 19,59''$$

$$\text{MP} = 12 - (0^\circ 14' 54'') \qquad 11^\circ 45' 6''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 24,81'') / 15 \qquad -0^\circ 30' 33,65''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad 11^\circ 40' 51,94''$$

8. Masjid Baitur Rohim Di Desa Ploso

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 25' 59,31''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 34,12''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 14 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 14' 03''$

Deklinasi Matahari ; $-8^{\circ} 17' 25''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 25' 59,31'' = 82^{\circ} 34' 0,69''$$

$$b. 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \lambda A - \lambda m = 112^{\circ} 38' 34,12'' - 39^{\circ} 50' = 72^{\circ} 48' 34,12''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 34' 0,69'' - \text{Cos } 82^{\circ} 34' 0,69'' \times$$

$$\text{Cotan } 72^{\circ} 48' 34,12''$$

$$\text{Sin } 72^{\circ} 48' 34,12''$$

$$= 69^{\circ} 50' 30,63'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 30,63'')$$

$$= 90^\circ - 69^\circ 50' 30,63'' = 20^\circ 9' 29,37'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 38' 34,12'') : 15) = -0^\circ 30' 34,27''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-8^\circ 17' 25'') = 98^\circ 17' 25''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 25' 59,31'' = 82^\circ 34' 0,69''$

A. $20^\circ 9' 29,37''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 34' 0,69'' \times \text{Tan } 20^\circ 9' 29,37'')$$

$$P = -87^\circ 16' 51,56''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos } ((1/\text{tan } 98^\circ 17' 25'') \times \text{tan } 82^\circ 34' 0,69'' \times \text{cos } -$$

$$87^\circ 16' 51,56'') + -87^\circ 16' 51,56''$$

$$= 93^\circ 2' 13,27'' + -87^\circ 16' 51,56''$$

$$C = 5^\circ 45' 21,71''$$

Langkah Berikutnya adalah $= C/15 + (12-e) + (\text{KWD})$

$$C/15 = 5^\circ 45' 21,71'' : 15 = 0^\circ 23' 1,45''$$

$$\text{MP} = 12 - (0^\circ 14' 03'') = 11^\circ 45' 57''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 34,12'') / 15 = -0^\circ 30' 34,27''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} = 11^\circ 38' 24,18''$$

9. Masjid Subulum Salam Di Desa Wonokasian

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 26' 20''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 59,88''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 12 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 13' 34''$

Deklinasi Matahari ; $-7^{\circ} 33' 35''$

Dari data di atas dapat diketahui:

$$a. \quad 90^{\circ} - \varphi A \quad = 90^{\circ} - 07^{\circ} 26' 20'' = 82^{\circ} 33' 40''$$

$$b. \quad 90^{\circ} - \varphi m \quad = 90^{\circ} - 21^{\circ} 25' \quad = 68^{\circ} 35'$$

$$c. \quad \lambda A - \lambda m \quad = 112^{\circ} 38' 59,88'' - 39^{\circ} 50' \quad = \\ 72^{\circ} 48' 59,88''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 33' 40'' - \text{Cos } 82^{\circ} 33' 40'' \times \text{Cotan } 72^{\circ} 48' 59,88''}{\text{Sin } 72^{\circ} 48' 59,88''}$$

$$\text{Sin } 72^{\circ} 48' 59,88''$$

$$= 69^{\circ} 50' 36,83'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 36,83'')$$

$$= 90^\circ - 69^\circ 50' 30,63'' = 20^\circ 9' 23,17'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 38' 59,88'') : 15) = -0^\circ 30' 35,99''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-7^\circ 33' 35'') = 97^\circ 33' 35''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 26' 20'' = 82^\circ 33' 40''$

A. $20^\circ 9' 23,17''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 33' 40'' \times \text{Tan } 20^\circ 9' 23,17'')$$

$$P = -87^\circ 16' 44,95''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos } ((1/\text{tan } 97^\circ 33' 35'') \times \text{tan } 82^\circ 33' 40'' \times \text{cos } -$$

$$87^\circ 16' 44,95'') + -87^\circ 16' 44,95''$$

$$= 92^\circ 45' 56,13'' + -87^\circ 16' 44,95''$$

$$C = 5^\circ 29' 11,18''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 5^\circ 29' 11,18'' : 15 = 0^\circ 21' 56,75''$$

$$\text{MP} = 12 - (0^\circ 13' 34'') = 11^\circ 46' 26''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 34,12'') / 15 = -0^\circ 13' 34''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} = 11^\circ 54' 48,75''$$

10. Masjid Nurul Huda Di Desa Wonokalang

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 25' 50,71''$

Bujur tempat masjid (λ) = $112^{\circ} 37' 17,64''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 19 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 15' 05''$

Deklinasi Matahari ; $-10^{\circ} 08' 06''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 25' 50,71'' = 82^{\circ} 34' 9,29''$$

$$b. 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \lambda A - \lambda m = 112^{\circ} 37' 17,64'' - 39^{\circ} 50' = 72^{\circ} 47' 17,64''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 34' 9,29'' - \text{Cos } 82^{\circ} 34' 9,29'' \times$$

$$\text{Cotan } 72^{\circ} 47' 17,61''$$

$$\text{Sin } 72^{\circ} 47' 17,61''$$

$$= 69^{\circ} 50' 28,96'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 28,96'')$$

$$= 90^{\circ} - 69^{\circ} 50' 28,96'' = 20^{\circ} 9' 31,04'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 37' 17,64'') : 15) = -0^\circ 30' 29,18''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-10^\circ 08' 06'') = 100^\circ 8' 6''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 25' 50,71'' = 82^\circ 34' 42,36''$

A. $20^\circ 9' 31,04''$

Proses Penghitungan =

1) $\text{Cotan } P = \text{Cos } b \times \text{Tan } A$

$$\text{Cotan } P = \text{shift tan } (1/\text{Cos } 82^\circ 34' 42,36'' \times \text{Tan } 20^\circ 9' 31,04'')$$

$$P = -87^\circ 17' 6,45''$$

2) $\text{Cos } (CP) = \text{Cotan } a \times \text{Tan } b \times \text{Cos } P + P$

$$\begin{aligned} &= \text{shift cos } ((1/\text{tan } 100^\circ 8' 6'') \times \text{tan } 82^\circ 34' 42,36'' \times \text{cos } (- \\ &87^\circ 17' 6,45'') + -87^\circ 17' 6,45'') = 93^\circ 43' 36,8'' + (- \\ &87^\circ 17' 6,45'') \end{aligned}$$

$$C = 6^\circ 26' 30,35''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 26' 30,35'' : 15 \qquad 0^\circ 25' 46,02''$$

$$\text{MP} = 12 - (0^\circ 15' 05'') \qquad 11^\circ 44' 55''$$

$$\text{KWD} = (105^\circ - 112^\circ 37' 17,64'') / 15 \qquad -0^\circ 30' 29,18''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad 11^\circ 40' 11,84''$$

11. Masjid Di Baitul Muttaqin Desa Simoketawang

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 27' 18,88''$

Bujur tempat masjid (λ) = $112^{\circ} 37' 17,23''$

Lintang Makkah ($\varphi \mathbf{M}$) : $21^{\circ} 25' \text{ LU}$

Bujur Makkah ($\lambda \mathbf{M}$) : $39^{\circ} 50' \text{ BT}$

Pada tanggal 20 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 15' 16''$

Deklinasi Matahari ; $-10^{\circ} 29' 38''$

Dari data di atas dapat diketahui:

$$\begin{aligned} \text{a. } 90^{\circ} - \varphi \text{ A} &= 90^{\circ} - 07^{\circ} 27' 18,88'' = \\ &82^{\circ} 32' 41,12'' \end{aligned}$$

$$\text{b. } 90^{\circ} - \varphi \text{ m} = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$\begin{aligned} \text{c. } \lambda \text{ A} - \lambda \text{ m} &= 112^{\circ} 37' 17,23'' - 39^{\circ} 50' = \\ &72^{\circ} 47' 17,23'' \end{aligned}$$

Rumus:

$$\text{Cotan } \mathbf{Q} = \frac{\text{Cotan } \mathbf{b} \times \text{Sin } \mathbf{a} - \text{Cos } \mathbf{a} \times \text{Cotan } \mathbf{c}}{\text{Sin } \mathbf{c}}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 32' 41,12'' - \text{Cos } 82^{\circ} 32' 41,12'' \times$$

$$\text{Cotan } 72^{\circ} 47' 17,23''$$

$$\text{Sin } 72^{\circ} 47' 17,23''$$

$$= 69^{\circ} 50' 56,96'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 56,96'')$$

$$= 90^\circ - 69^\circ 50' 56,96'' = 20^\circ 9' 3,04'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 37' 17,23'') : 15) = -0^\circ 30' 29,15''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-10^\circ 29' 38'') = 100^\circ 29' 38''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 27' 18,88'' = 82^\circ 32' 41,12''$

A. $20^\circ 9' 3,04''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 32' 41,12'' \times \text{Tan } 20^\circ 9' 3,04'')$$

$$P = -87^\circ 16' 26,53''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos } ((1/\text{tan } 100^\circ 29' 38'') \times \text{tan } 82^\circ 32' 41,12'' \times \text{cos}$$

$$(-87^\circ 16' 26,53'') + -87^\circ 16' 26,53''$$

$$= 93^\circ 51' 36,19'' + -87^\circ 16' 26,53''$$

$$C = 6^\circ 33' 9,66''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 33' 9,66'' : 15 = 0^\circ 26' 20,64''$$

$$\text{MP} = 12 - (0^\circ 15' 16'') = 11^\circ 44' 34''$$

$$\text{KWD} = (105^\circ - 112^\circ 37' 17,23'') / 15 = -0^\circ 30' 29,15''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} = 11^\circ 40' 25,49''$$

12. Masjid Khusnul Khotimah Di Desa Sumberrejo

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 26' 53,44''$

Bujur tempat masjid (λ) = $112^{\circ} 39' 43,09''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 21 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 15' 26''$

Deklinasi Matahari ; $-10^{\circ} 51' 00''$

Dari data di atas dapat diketahui:

$$a. \quad 90^{\circ} - \varphi A \quad = 90^{\circ} - 07^{\circ} 26' 53,44'' \quad = 82^{\circ} 33' 6,56''$$

$$b. \quad 90^{\circ} - \varphi m \quad = 90^{\circ} - 21^{\circ} 25' \quad = 68^{\circ} 35'$$

$$c. \quad \lambda A - \lambda m \quad = 112^{\circ} 39' 43,09'' - 39^{\circ} 50' \quad = 72^{\circ} 49' 43,09''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 33' 6,56'' - \text{Cos } 82^{\circ} 33' 6,56'' \times$$

$$\text{Cotan } 72^{\circ} 49' 43,09''$$

$$\text{Sin } 72^{\circ} 49' 43,09''$$

$$= 69^{\circ} 50' 46,81'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 46,81'')$$

$$= 90^\circ - 69^\circ 50' 46,81'' = 20^\circ 9' 13,19'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 39' 43,09'') : 15) = -0^\circ 30' 38,87''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-10^\circ 15' 00'') = 100^\circ 15' 00''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 26' 53,44'' = 82^\circ 33' 6,56''$

A. $20^\circ 9' 13,19''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 33' 6,56'' \times \text{Tan } 20^\circ 9' 13,19'')$$

$$P = -87^\circ 16' 34,27''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos } ((1/\text{tan } 100^\circ 15' 00'') \times \text{tan } 82^\circ 33' 6,56'' \times$$

$$\text{cos } (-87^\circ 16' 34,27'') + -87^\circ 16' 34,27''$$

$$= 93^\circ 59' 42,26'' + -87^\circ 16' 34,27''$$

$$C = 6^\circ 43' 7,99''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 43' 7,99'' : 15 = 0^\circ 26' 52,53''$$

$$\text{MP} = 12 - (0^\circ 15' 26'') = 11^\circ 44' 34''$$

$$\text{KWD} = (105^\circ - 112^\circ 39' 43,09'') / 15 = -0^\circ 30' 38,87''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} = 11^\circ 40' 47,66''$$

13. Masjid Darul Hikmah Di Desa Karang Puri

Diketahui :

Lintang tempat masjid (ϕ) = $07^{\circ} 24' 47,55''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 04,39''$

Lintang Makkah (ϕM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 23 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 15' 44''$

Deklinasi Matahari ; $-11^{\circ} 33' 15''$

Dari data di atas dapat diketahui:

$$a. \quad 90^{\circ} - \phi A = 90^{\circ} - 07^{\circ} 24' 47,55'' = 82^{\circ} 35' 12,45''$$

$$b. \quad 90^{\circ} - \phi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \quad \lambda A - \lambda m = 112^{\circ} 38' 04,39'' - 39^{\circ} 50' = 72^{\circ} 48' 4,39''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 35' 12,45'' - \text{Cos } 82^{\circ} 35' 12,45'' \times \text{Cotan } 72^{\circ} 48' 4,39''}{\text{Sin } 72^{\circ} 48' 4,39''}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 35' 12,45'' - \text{Cos } 82^{\circ} 35' 12,45'' \times \text{Cotan } 72^{\circ} 48' 4,39''}{\text{Sin } 72^{\circ} 48' 4,39''}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 35' 12,45'' - \text{Cos } 82^{\circ} 35' 12,45'' \times \text{Cotan } 72^{\circ} 48' 4,39''}{\text{Sin } 72^{\circ} 48' 4,39''}$$

$$= 69^{\circ} 50' 8,28'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 8,28'')$$

$$= 90^{\circ} - 69^{\circ} 50' 8,28'' = 20^{\circ} 90' 51,72'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 38' 04,39'') : 15) = -0^\circ 30' 32,29''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-11^\circ 33' 15'') = 101^\circ 33' 15''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 24' 47,55'' = 82^\circ 35' 12,45''$

A. $20^\circ 90' 51,72''$

Proses Penghitungan =

1) $\text{Cotan } P = \text{Cos } b \times \text{Tan } A$

$$\text{Cotan } P = \text{shift tan } (1/\text{Cos } 82^\circ 35' 12,45'' \times \text{Tan } 20^\circ 90' 51,72'')$$

$$P = -87^\circ 5' 18,23''$$

2) $\text{Cos } (CP) = \text{Cotan } a \times \text{Tan } b \times \text{Cos } P + P$

$$= \text{shift cos } ((1/\text{tan } 101^\circ 33' 15'') \times \text{tan } 82^\circ 35' 12,45'' \times \text{cos } (-87^\circ 5' 18,23'')) + -87^\circ 5' 18,23''$$

$$= 94^\circ 34' 39,83'' + -87^\circ 5' 18,23''$$

$$= 7^\circ 29' 21,6''$$

$$C = 7^\circ 29' 21,6''$$

Langkah Berikutnya adalah $= C/15 + (12-e) + (\text{KWD})$

$$C/15 = 7^\circ 29' 21,6'' : 15 \qquad 0^\circ 29' 57,44''$$

$$\text{MP} = 12 - (0^\circ 15' 44'') \qquad 11^\circ 44' 16''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 04,39'') / 15 \qquad -0^\circ 30' 32,29''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad 11^\circ 43' 41,15''$$

14. Masjid Baitus Salam Di Desa Mojorangagung

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 26' 19,02''$

Bujur tempat masjid (λ) = $112^{\circ} 39' 46,67''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 22 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 15' 35''$

Deklinasi Matahari ; $-11^{\circ} 12' 13''$

Dari data di atas dapat diketahui:

$$\begin{aligned} \text{a. } 90^{\circ} - \varphi A &= 90^{\circ} - 07^{\circ} 26' 19,02'' = \\ &82^{\circ} 33' 40,98'' \end{aligned}$$

$$\text{b. } 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$\begin{aligned} \text{c. } \lambda A - \lambda m &= 112^{\circ} 39' 46,67'' - 39^{\circ} 50' = \\ &72^{\circ} 49' 46,67'' \end{aligned}$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 33' 40,98'' - \text{Cos } 82^{\circ} 33' 40,98'' \times$$

$$\text{Cotan } 72^{\circ} 49' 46,67''$$

$$\text{Sin } 72^{\circ} 49' 46,67''$$

$$= 69^{\circ} 50' 35,86'' \text{ (dari titik B - U)}$$

$$= 90^\circ - (69^\circ 50' 35,86'')$$

$$= 90^\circ - 69^\circ 50' 35,86'' = 20^\circ 9' 24,14'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 39' 46,67'') : 15) = -0^\circ 30' 39,11''$$

Rumus Pembantu =

$$a. 90^\circ - \text{Deklinasi} = 90^\circ - (-11^\circ 12' 13'') = 101^\circ 12' 13''$$

$$b. 90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 26' 19,02'' = 82^\circ 33' 40,98''$$

$$A. 20^\circ 9' 24,14''$$

Proses Penghitungan =

$$1) \text{Cotan P} = \text{Cos b} \times \text{Tan A}$$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 33' 40,98'' \times \text{Tan } 20^\circ 9' 24,14'')$$

$$P = -87^\circ 16' 45,17''$$

$$2) \text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$$

$$= \text{shift cos } ((1/\text{tan } 101^\circ 12' 13'') \times \text{tan } 82^\circ 33' 40,98'' \times \text{cos}$$

$$(-87^\circ 16' 45,17'') + -87^\circ 16' 45,17''$$

$$= 94^\circ 7' 46,58'' + -87^\circ 16' 45,17''$$

$$C = 6^\circ 51' 1,41''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 51' 1,41'' : 15 \qquad 0^\circ 27' 24,09''$$

$$\text{MP} = 12 - (0^\circ 15' 35'') \qquad 11^\circ 44' 25''$$

$$\text{KWD} = (105^\circ - 112^\circ 39' 46,67'') / 15 \qquad -0^\circ 30' 39,11''$$

_____ +

Bayang bayang kiblat (WIB) $11^{\circ}41'9,98''$

15. Masjid Nurul Yakin Di Desa Lambangan

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 25' 43,08''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 30,38''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 16 Oktober 2012

Eq. Of Time (e) : $0^{\circ}14'54''$

Deklinasi Matahari ; $-9^{\circ} 46'26''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 25' 43,08'' = 82^{\circ}34'16,92''$$

$$b. 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ}25' = 68^{\circ}35'$$

$$c. \lambda A - \lambda m = 112^{\circ}38'30,38'' - 39^{\circ}50' = 72^{\circ}48'30,38''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ}35' \times \text{Sin } 82^{\circ}34'16,92'' - \text{Cos } 82^{\circ}34'16,92'' \times$$

$$\text{Cotan } 72^{\circ}48'30,38''$$

$$\text{Sin } 72^{\circ}48'30,38''$$

$$= 69^{\circ}50'25,53'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ}50'25,53'')$$

$$= 90^\circ - 69^\circ 50' 25,53'' = 20^\circ 9' 34,47'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 38' 30,38'') : 15) = -0^\circ 30' 34,05''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-9^\circ 46' 26'') = 99^\circ 46' 26''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 25' 43,08'' = 82^\circ 34' 16,92''$

A. $20^\circ 9' 34,47''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 34' 16,92'' \times \text{Tan } 20^\circ 9' 34,47'')$$

$$P = -87^\circ 16' 56,71''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos } ((1/\text{tan } 99^\circ 46' 26'') \times \text{tan } 82^\circ 34' 16,92'' \times \text{cos}$$

$$(-87^\circ 16' 56,71'') + -87^\circ 16' 56,71''$$

$$= 93^\circ 35' 28,92'' + -87^\circ 16' 56,71''$$

$$C = 6^\circ 18' 32,24''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 18' 32,24'' : 15 \qquad \qquad \qquad 0^\circ 25' 14,15''$$

$$\text{MP} = 12 - (0^\circ 14' 54'') \qquad \qquad \qquad 11^\circ 45' 6''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 30,38'') / 15 \qquad \qquad \qquad -0^\circ 30' 34,05''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad \qquad \qquad 11^\circ 39' 46,2''$$

16. Masjid Baitur Rohman Di Desa Mulyodadi

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 26' 05,70''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 08,13''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 10 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 14' 30''$

Deklinasi Matahari ; $-9^{\circ} 02' 39''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 26' 05,70'' = 82^{\circ} 33' 54,3''$$

$$b. 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \lambda A - \lambda m = 112^{\circ} 38' 08,13'' - 39^{\circ} 50' = 72^{\circ} 48' 8,13''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 33' 54,3'' - \text{Cos } 82^{\circ} 33' 54,3'' \times \text{Cotan } 72^{\circ} 48' 8,13''}{\text{Sin } 72^{\circ} 48' 8,13''}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 33' 54,3'' - \text{Cos } 82^{\circ} 33' 54,3'' \times \text{Cotan } 72^{\circ} 48' 8,13''}{\text{Sin } 72^{\circ} 48' 8,13''}$$

$$\text{Sin } 72^{\circ} 48' 8,13''$$

$$= 69^{\circ} 50' 33,02'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 33,02'')$$

$$= 90^{\circ} - 69^{\circ} 50' 33,02'' = 20^{\circ} 9' 26,98'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 38' 08,13'') : 15) = -0^\circ 30' 32,54''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-9^\circ 02' 39'') = 99^\circ 2' 39''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 26' 05,70'' = 82^\circ 35' 54,3''$

A. $20^\circ 9' 26,98''$

Proses Penghitungan =

1) $\text{Cotan } P = \text{Cos } b \times \text{Tan } A$

$$\text{Cotan } P = \text{shift tan } (1/\text{Cos } 82^\circ 35' 54,3'' \times \text{Tan } 20^\circ 9' 26,98'')$$

$$P = -87^\circ 19' 0,35''$$

2) $\text{Cos } (CP) = \text{Cotan } a \times \text{Tan } b \times \text{Cos } P + P$

$$= \text{shift cos } ((1/\text{tan } 99^\circ 2' 39'') \times \text{tan } 82^\circ 35' 54,3'' \times \text{cos } (-87^\circ 19' 0,35'')) + -87^\circ 19' 0,35''$$

$$= 93^\circ 19' 7,18'' + -87^\circ 19' 0,35''$$

$$C = 6^\circ 0' 6,83''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 0' 6,83'' : 15 \qquad 0^\circ 24' 0,46''$$

$$\text{MP} = 12 - (0^\circ 14' 30'') \qquad 11^\circ 45' 30''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 08,13'') / 15 \qquad -0^\circ 30' 32,54''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad 11^\circ 38' 57,72''$$

17. Masjid Baitul Amin Di Desa Pagerngumbuk

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 25' 50,49''$

Bujur tempat masjid (λ) = $112^{\circ} 37' 39,46''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 15 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 14' 16''$

Deklinasi Matahari ; $-8^{\circ} 40' 34''$

Dari data di atas dapat diketahui:

$$a. \quad 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 25' 50,49'' = 82^{\circ} 34' 9,51''$$

$$b. \quad 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \quad \lambda A - \lambda m = 112^{\circ} 37' 39,46'' - 39^{\circ} 50' = 72^{\circ} 47' 39,46''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 34' 9,51'' - \text{Cos } 82^{\circ} 34' 9,51'' \times$$

$$\text{Cotan } 72^{\circ} 47' 39,46''$$

$$\text{Sin } 72^{\circ} 47' 39,46''$$

$$= 69^{\circ} 50' 28,69'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 28,69'')$$

$$= 90^{\circ} - 69^{\circ} 50' 28,69'' = 20^{\circ} 9' 31,41'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 37' 39,46'') : 15) = -0^\circ 30' 30,63''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-8^\circ 40' 34'') = 98^\circ 40' 34''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 25' 50,49'' = 82^\circ 34' 9,51''$

A. $20^\circ 9' 31,41''$

Proses Penghitungan =

1) $\text{Cotan } P = \text{Cos } b \times \text{Tan } A$

$$\text{Cotan } P = \text{shift tan } (1/\text{Cos } 82^\circ 34' 9,51'' \times \text{Tan } 20^\circ 9' 31,41'')$$

$$P = -87^\circ 16' 54,46''$$

2) $\text{Cos } (CP) = \text{Cotan } a \times \text{Tan } b \times \text{Cos } P + P$

$$= \text{shift cos } ((1/\text{tan } 98^\circ 40' 34'') \times \text{tan } 82^\circ 34' 9,51'' \times \text{cos } (-87^\circ 16' 54,46'')) + -87^\circ 16' 54,46''$$

$$= 92^\circ 57' 27,14'' + -87^\circ 16' 54,46''$$

$$C = 5^\circ 40' 32,62''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 5^\circ 40' 32,62'' : 15 \qquad 0^\circ 22' 42,18''$$

$$\text{MP} = 12 - (0^\circ 14' 16'') \qquad 11^\circ 45' 44''$$

$$\text{KWD} = (105^\circ - 112^\circ 37' 39,46'') / 15 \qquad -0^\circ 30' 30,63''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad 11^\circ 37' 55,55''$$

18. Masjid Bahrul Huda Di Desa Plaosan

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 25' 29,15''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 05,59''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 14 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 14' 03''$

Deklinasi Matahari ; $-8^{\circ} 18' 21''$

Dari data di atas dapat diketahui:

$$a. \quad 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 25' 29,15'' = 82^{\circ} 34' 30,85''$$

$$b. \quad 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \quad \lambda A - \lambda m = 112^{\circ} 38' 05,59'' - 39^{\circ} 50' = 72^{\circ} 48' 5,59''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 34' 30,85'' - \text{Cos } 82^{\circ} 34' 30,85'' \times$$

$$\text{Cotan } 72^{\circ} 48' 5,59''$$

$$\text{Sin } 72^{\circ} 48' 5,59''$$

$$= 69^{\circ} 50' 21,45'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 21,45'')$$

$$= 90^{\circ} - 69^{\circ} 50' 21,45'' = 20^{\circ} 9' 38,55'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 38' 05,59'') : 15) = -0^\circ 30' 32,37''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-8^\circ 18' 21'') = 98^\circ 18' 21''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 25' 29,13'' = 82^\circ 34' 30,85''$

A. $20^\circ 9' 38,55''$

Proses Penghitungan =

1) $\text{Cotan } P = \text{Cos } b \times \text{Tan } A$

$$\text{Cotan } P = \text{shift tan } (1/\text{Cos } 82^\circ 34' 30,85'' \times \text{Tan } 20^\circ 9' 38,55'')$$

$$P = -87^\circ 17' 1,17''$$

2) $\text{Cos } (CP) = \text{Cotan } a \times \text{Tan } b \times \text{Cos } P + P$

$$= \text{shift cos } ((1/\text{tan } 98^\circ 18' 21'') \times \text{tan } 82^\circ 34' 30,85'' \times \text{cos}$$

$$(-87^\circ 17' 1,17'') + -87^\circ 17' 1,17''$$

$$= 93^\circ 2' 35,84'' + -87^\circ 17' 17,17''$$

$$C = 5^\circ 45' 34,67''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 5^\circ 45' 34,67'' : 15 \qquad 0^\circ 23' 2,31''$$

$$\text{MP} = 12 - (0^\circ 14' 03'') \qquad 11^\circ 45' 57''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 05,59'') / 15 \qquad -0^\circ 30' 32,37''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad 11^\circ 38' 26,94''$$

19. Masjid Roudhatul Jannah Di Desa Becirongengor

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 25' 14,75''$

Bujur tempat masjid (λ) = $112^{\circ} 38' 43,08''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 23 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 15' 44''$

Deklinasi Matahari ; $-11^{\circ} 33' 15''$

Dari data di atas dapat diketahui:

$$a. \quad 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 25' 14,75'' = 82^{\circ} 34' 45,25''$$

$$b. \quad 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \quad \lambda A - \lambda m = 112^{\circ} 38' 43,08'' - 39^{\circ} 50' = 72^{\circ} 48' 43,08''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 34' 45,25'' - \text{Cos } 82^{\circ} 34' 45,25'' \times$$

$$\text{Cotan } 72^{\circ} 48' 43,08''}{\text{Sin } 72^{\circ} 48' 43,08''}$$

$$= 69^{\circ} 50' 16,37'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 16,37'')$$

$$= 90^{\circ} - 69^{\circ} 50' 16,37'' = 20^{\circ} 9' 43,63'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 38' 43,08'') : 15) = -0^\circ 30' 34,87''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-11^\circ 33' 15'') = 101^\circ 33' 15''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 25' 14,75'' = 82^\circ 34' 45,25''$

A. $20^\circ 9' 43,63''$

Proses Penghitungan =

1) $\text{Cotan } P = \text{Cos } b \times \text{Tan } A$

$$\text{Cotan } P = \text{shift tan } (1/\text{Cos } 82^\circ 34' 45,25'' \times \text{Tan } 20^\circ 9' 43,63'')$$

$$P = -87^\circ 17' 5,66''$$

2) $\text{Cos } (CP) = \text{Cotan } a \times \text{Tan } b \times \text{Cos } P + P$

$$= \text{shift cos } ((1/\text{tan } 101^\circ 33' 15'') \times \text{tan } 82^\circ 34' 45,25'' \times \text{cos}$$

$$(-87^\circ 17' 5,56'') + -87^\circ 17' 5,56''$$

$$= 94^\circ 15' 50,46'' + -87^\circ 17' 5,56''$$

$$C = 6^\circ 58' 44,8''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 58' 44,8'' : 15 \qquad 0^\circ 27' 54,99''$$

$$\text{MP} = 12 - (0^\circ 15' 44'') \qquad 11^\circ 44' 16''$$

$$\text{KWD} = (105^\circ - 112^\circ 38' 43,08'') / 15 \qquad -0^\circ 30' 34,87''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad 11^\circ 41' 36,12''$$

20. Masjid Al Kaffi Di Desa Sawocangkring

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 25' 30,07''$

Bujur tempat masjid (λ) = $112^{\circ} 39' 20,99''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 21 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 15' 26''$

Deklinasi Matahari ; $-10^{\circ} 51' 00''$

Dari data di atas dapat diketahui:

$$a. 90^{\circ} - \varphi A = 90^{\circ} - 07^{\circ} 25' 30,07'' = 82^{\circ} 34' 29,93''$$

$$b. 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$c. \lambda A - \lambda m = 112^{\circ} 39' 20,99'' - 39^{\circ} 50' = 72^{\circ} 49' 20,99''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 34' 29,93'' - \text{Cos } 82^{\circ} 34' 29,93'' \times$$

$$\text{Cotan } 72^{\circ} 49' 20,99''$$

$$\text{Sin } 72^{\circ} 49' 20,99''$$

$$= 69^{\circ} 50' 20,69'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 50' 20,69'')$$

$$= 90^{\circ} - 69^{\circ} 50' 20,69'' = 20^{\circ} 9' 39,31'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 39' 20,99'') : 15) = -0^\circ 30' 37,4''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-10^\circ 51' 00'') = 100^\circ 51' 0''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 25' 30,07'' = 82^\circ 34' 29,93''$

c. $20^\circ 9' 39,31''$

Proses Penghitungan =

1) $\text{Cotan } P = \text{Cos } b \times \text{Tan } A$

$$\text{Cotan } P = \text{shift tan } (1/\text{Cos } 82^\circ 34' 29,93'' \times \text{Tan } 20^\circ 9' 39,31'')$$

$$P = -87^\circ 17' 0,64''$$

2) $\text{Cos } (CP) = \text{Cotan } a \times \text{Tan } b \times \text{Cos } P + P$

$$= \text{shift cos } ((1/\text{tan } 100^\circ 51' 00'') \times \text{tan } 82^\circ 34' 29,93'' \times \text{cos}$$

$$(-87^\circ 17' 0,64'') + -87^\circ 17' 0,64''$$

$$= 93^\circ 59' 58,87'' + -87^\circ 17' 0,64''$$

$$C = 6^\circ 42' 48,23''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 42' 48,23'' : 15 \qquad 0^\circ 26' 51,22''$$

$$\text{MP} = 12 - (0^\circ 15' 26'') \qquad 11^\circ 44' 34''$$

$$\text{KWD} = (105^\circ - 112^\circ 39' 20,99'') / 15 \qquad -0^\circ 30' 37,4''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad 11^\circ 40' 47,82''$$

21. Masjid Darul Hikmah Di Desa Simo angin angin

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 26' 38,12''$

Bujur tempat masjid (λ) = $112^{\circ} 37' 07,76''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 20 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 15' 16''$

Deklinasi Matahari ; $-10^{\circ} 29' 38''$

Dari data di atas dapat diketahui:

$$\begin{aligned} \text{a. } 90^{\circ} - \varphi A &= 90^{\circ} - 07^{\circ} 26' 38,12'' = \\ &82^{\circ} 33' 21,88'' \end{aligned}$$

$$\text{b. } 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$\text{c. } \lambda A - \lambda m = 112^{\circ} 37' 07,76'' - 39^{\circ} 50' = 72^{\circ} 47' 7,76''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 33' 21,88'' - \text{Cos } 82^{\circ} 33' 21,88'' \times$$

$$\text{Cotan } 72^{\circ} 47' 7,76''$$

$$\text{Sin } 72^{\circ} 47' 7,76''$$

$$= 69^{\circ} 58' 56,78'' \text{ (dari titik B - U)}$$

$$= 90^{\circ} - (69^{\circ} 58' 56,78'')$$

$$= 90^\circ - 69^\circ 58' 56,78'' = 20^\circ 1' 3,22'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 37' 07,76'') : 15) = -0^\circ 30' 28,52''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-10^\circ 29' 38'') = 100^\circ 29' 38''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 26' 38,12'' = 82^\circ 33' 21,88''$

A. $20^\circ 1' 3,22''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 33' 21,88'' \times \text{Tan } 20^\circ 1' 3,22'')$$

$$P = -87^\circ 17' 51,64''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos } ((1/\text{tan } 100^\circ 29' 38'') \times \text{tan } 82^\circ 33' 21,88'' \times \text{cos}$$

$$(-87^\circ 17' 51,64'') + -87^\circ 17' 51,64''$$

$$= 93^\circ 49' 56,8'' + -87^\circ 17' 51,64''$$

$$C = 6^\circ 32' 5,16''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 32' 5,16'' : 15 = 0^\circ 26' 8,34''$$

$$\text{MP} = 12 - (0^\circ 15' 16'') = 11^\circ 44' 44''$$

$$\text{KWD} = (105^\circ - 112^\circ 37' 07,76'') / 15 = -0^\circ 30' 28,52''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} = 11^\circ 40' 23,82''$$

22. Masjid Baitur Rohman Di Desa Tanggul

Diketahui :

Lintang tempat masjid (φ) = $07^{\circ} 26' 34,16''$

Bujur tempat masjid (λ) = $112^{\circ} 36' 28,35''$

Lintang Makkah (φM) : $21^{\circ} 25' LU$

Bujur Makkah (λM) : $39^{\circ} 50' BT$

Pada tanggal 22 Oktober 2012

Eq. Of Time (e) : $0^{\circ} 15' 35''$

Deklinasi Matahari ; $-11^{\circ} 12' 13''$

Dari data di atas dapat diketahui:

$$\begin{aligned} \text{a. } 90^{\circ} - \varphi A &= 90^{\circ} - 07^{\circ} 26' 34,16'' = \\ &82^{\circ} 33' 25,84'' \end{aligned}$$

$$\text{b. } 90^{\circ} - \varphi m = 90^{\circ} - 21^{\circ} 25' = 68^{\circ} 35'$$

$$\begin{aligned} \text{c. } \lambda A - \lambda m &= 112^{\circ} 36' 28,35'' - 39^{\circ} 50' = \\ &72^{\circ} 46' 28,35'' \end{aligned}$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^{\circ} 35' \times \text{Sin } 82^{\circ} 33' 25,84'' - \text{Cos } 82^{\circ} 33' 25,84'' \times$$

$$\text{Cotan } 72^{\circ} 46' 28,35''$$

$$\text{Sin } 72^{\circ} 46' 28,35''$$

$$= 69^{\circ} 50' 43,44'' \text{ (dari titik B - U)}$$

$$= 90^\circ - (69^\circ 50' 43,44'')$$

$$= 90^\circ - 69^\circ 50' 43,44'' = 20^\circ 9' 16,56'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 36' 28,35'') : 15) = -0^\circ 30' 25,89''$$

Rumus Pembantu =

$$a. 90^\circ - \text{Deklinasi} = 90^\circ - (-11^\circ 12' 13'') = 101^\circ 12' 13''$$

$$b. 90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 26' 34,16'' = 82^\circ 33' 25,84''$$

$$A. 20^\circ 9' 16,56''$$

Proses Penghitungan =

$$1) \text{Cotan P} = \text{Cos b} \times \text{Tan A}$$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 33' 25,84'' \times \text{Tan } 20^\circ 9' 16,56'')$$

$$P = -87^\circ 17' 40,78''$$

$$2) \text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$$

$$= \text{shift cos } ((1/\text{tan } 101^\circ 12' 13'') \times \text{tan } 82^\circ 33' 25,84'' \times \text{cos}$$

$$(-87^\circ 17' 40,78'') + -87^\circ 17' 40,78''$$

$$= 94^\circ 7' 39,52'' + -87^\circ 17' 40,78''$$

$$C = 6^\circ 50' 58,74''$$

Langkah Berikutnya adalah = C/15 + (12-e) + (KWD)

$$C/15 = 6^\circ 50' 58,74'' : 15$$

$$0^\circ 27' 23,92''$$

$$MP = 12 - (0^\circ 15' 35'')$$

$$11^\circ 44' 25''$$

$$KWD = (105^\circ - 112^\circ 36' 28,35'') / 15$$

$$-0^\circ 30' 25,89''$$

_____ +

Bayang bayang kiblat (WIB)

11°41'23,03"

23. Masjid Maslakul Mujahidin Di Desa Candinegoro

Diketahui :

Lintang tempat masjid (φ) = 07° 24' 53,60"

Bujur tempat masjid (λ) = 112° 43' 04"

Lintang Makkah (φM) : 21° 25' LU

Bujur Makkah (λM) : 39° 50' BT

Pada tanggal 19 Oktober 2012

Eq. Of Time (e) : 0°15'05"

Deklinasi Matahari ; -10° 08'06"

Dari data di atas dapat diketahui:

$$a. \quad 90^\circ - \varphi A = 90^\circ - 07^\circ 24' 53,60'' = 82^\circ 35' 6,4''$$

$$b. \quad 90^\circ - \varphi m = 90^\circ - 21^\circ 25' = 68^\circ 35'$$

$$c. \quad \lambda A - \lambda m = 112^\circ 36' 28,35'' - 39^\circ 50' = 72^\circ 47' 43,04''$$

Rumus:

$$\text{Cotan } Q = \frac{\text{Cotan } b \times \text{Sin } a - \text{Cos } a \times \text{Cotan } c}{\text{Sin } c}$$

$$= \frac{\text{Cotan } 68^\circ 35' \times \text{Sin } 82^\circ 35' 6,4'' - \text{Cos } 82^\circ 35' 6,4'' \times \text{Cotan } 72^\circ 47' 43,04''}{\text{Sin } 72^\circ 47' 43,04''}$$

$$\text{Sin } 72^\circ 47' 43,04''$$

$$= 69^\circ 50' 10,48'' \text{ (dari titik B - U)}$$

$$= 90^\circ - (69^\circ 50', 10,48'')$$

$$= 90^\circ - 69^\circ 50' 10,48'' = 20^\circ 47' 43,04'' \text{ (dari titik U - B)}$$

Kwd :

(Bujur Standar – Bujur Tempat / 15) :

$$((105^\circ - 112^\circ 37' 43,04'') : 15) = -0^\circ 30' 30,87''$$

Rumus Pembantu =

a. $90^\circ - \text{Deklinasi} = 90^\circ - (-10^\circ 08' 06'') = 100^\circ 8' 6''$

b. $90^\circ - \text{Lintang Tempat} = 90^\circ - 7^\circ 24' 53,60'' = 82^\circ 35' 6,4''$

A. $20^\circ 9' 49,52''$

Proses Penghitungan =

1) $\text{Cotan P} = \text{Cos b} \times \text{Tan A}$

$$\text{Cotan P} = \text{shift tan } (1/\text{Cos } 82^\circ 35' 6,4'' \times \text{Tan } 20^\circ 9' 49,52'')$$

$$P = -87^\circ 17' 12,48''$$

2) $\text{Cos (CP)} = \text{Cotan a} \times \text{Tan b} \times \text{Cos P} + P$

$$= \text{shift cos } ((1/\text{tan } 100^\circ 8' 6'') \times \text{tan } 82^\circ 35' 6,4'' \times \text{cos } (-$$

$$87^\circ 17' 12,48'') + -87^\circ 17' 12,48''$$

$$= 93^\circ 43' 40,73'' + -87^\circ 17' 12,48''$$

$$C = 6^\circ 26' 28,26''$$

Langkah Berikutnya adalah = $C/15 + (12-e) + (\text{KWD})$

$$C/15 = 6^\circ 26' 28,26'' : 15 \qquad \qquad \qquad 0^\circ 25' 45,88''$$

$$\text{MP} = 12 - (0^\circ 15' 05'') \qquad \qquad \qquad 11^\circ 44' 55''$$

$$\text{KWD} = (105^\circ - 112^\circ 37' 43,04'') / 15 \qquad \qquad \qquad -0^\circ 30' 30,87''$$

_____ +

$$\text{Bayang bayang kiblat (WIB)} \qquad \qquad \qquad 11^\circ 39' 20,01''$$

Table 4.7

Nilai Deviasi Hasil Perhitungan Teori Dengan Hasil Penelitian.

No	Tanggal	Nama Masjid	Arah Kiblat Masjid (B-U)	Arah Kiblat		Deviasi
				Bayang Kiblat (Jam)	Derajat (B-U)	
1	20 Oktober 2013	Baitul Muttaqin	18°9'3,04"	11°40'25,49"	20° 9' 3,04"	2°
2	17 Oktober 2013	Baitur Rohman	19°9'9,26"	12°8'52,74"	20° 9' 9,26"	1°
3	16 Oktober 2013	Baitul Iksan	18°9'7,6"	11°39'06"	20° 9' 7,6"	2°
4	10 Oktober 2013	Baitus Salam	19°9'17,54"	12°14'47,11"	20° 9' 17,54"	1°
5	11 Oktober 2013	An-Nur	19°9'7,6"	11°39'06"	20° 9' 7,6"	1°
6	21 Oktober 2013	Khusnul Khotimah	17°9'13,19"	11°40'47,66"	20° 9' 13,19"	3°
7	22 Oktober 2013	Baitus Salam	19°39'24,41"	11°41'9,98"	20° 9' 24,14"	0,5°
8	12 Oktober 2013	Subulum Salam	17°9'23,17"	11°54'48,75"	20° 9' 23,17"	3°
9	14 Oktober 2013	Baitur Rohman	19°9'29,37"	11°38'24,18"	20° 9' 29,37"	1°
10	18 Oktober 2013	Al Mubarakah	18°9'17,36"	11°40'51,94"	20° 9' 17,36"	2°
11	13 Oktober 2013	Maslahul Huda	18°9'23,2"	11°38'11,87"	20° 9' 23,2"	2°
12	15 Oktober 2013	Baitul Muttaqin	16°59'37,49"	11°38'38,97"	19°59' 37,49"	2°
13	20 Oktober 2013	Darul Hikmah	19°1'3,22"	11°40'23,82"	20° 1' 3,22"	1°
14	22 Oktober 2013	Baitur Rohman	19°9'16,56"	11°41'23,03"	20° 9' 16,56"	1°

15	19 Oktober 2013	Nurul Huda	19°9'31,04"	11°40'11,84"	20° 9' 31,04"	1°
16	15 Oktober 2013	Baitul Amin	17°9'31,41"	11°37'55,55"	20° 9' 31,41"	3°
17	14 Oktober 2013	Bahrul Huda	17°9'38,55"	11°38'26,94"	20° 9' 38,55"	3°
18	10 Oktober 2013	Baitur Rohman	18°9'26,98"	11°38'57,72"	20° 9' 26,98"	2°
19	16 Oktober 2013	Nurul Yakin	18°9'34,47"	11°39'46,2"	20° 9' 34,47"	2°
20	21 Oktober 2013	Al Kaffi	18°9'39,31"	11°40'47,82"	20° 9' 39,31"	2°
21	23 Oktober 2013	Roudhatul Jannah	19°9'43,63"	11°41'36,12"	20° 9' 43,63"	1°
22	23 Oktober 2013	Darul Hikmah	19°9'51,72"	11°43'41,15"	20° 9' 51,72"	1°
23	19 Oktober 2013	Maslakul Mujahidin	17°47'43,04"	11°39'20,01"	20° 47' 43,04"	3°

