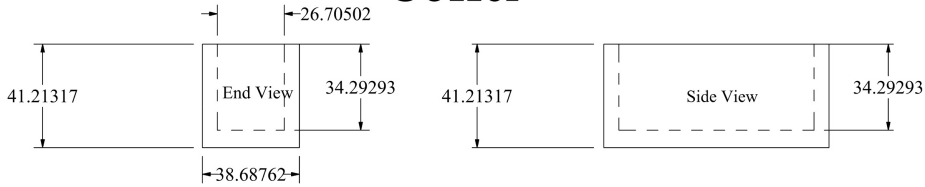Volume of Coffer (or Ark) = W x L x H =
77.80139 x 26.70502 x 34.29292 =
71249.977257 or very nearly 71,250 Cubic Inches

These numbers are truncated, so the value
falls short of the ideal...

Coffer

Top View

77.80139

38.68761

26.70502

89.78386

End View

26.70502

41.21317

34.29293

38.68762

Side View

41.21317

34.29293

Volume of Ark is 2.5 x 1.5 x 1.5 Cubits =
5.625 Cubic Cubits

But what is the relationship between the inch and the cubit?
If the interior volumes of the Coffer and Ark are equal,
then the ratio of the cube roots of these
volume measurements will give the scale factor.

$$\sqrt[3]{71,250} \Big/ \sqrt[3]{5.625}$$

= 41.456721709248 / 1.778446652245

= 23.3106355239362272 inches per cubit

However, the dimensions of the Ark are
probably exterior measures, not interior.
Since the interior volume is necessarily
smaller than the exterior volume, a thickness
of the materials that formed the Ark must be
assumed....

A smaller interior volume for the Ark than 5.625 Cubic
Cubits will require that the Cubit be longer than
the 23.3 inches derived above.
If we assume the Cubit was 25 inches long, the thickness
of the walls and bottom of the Ark can be estimated....

Cube root of Coffer's Volume / 25 = Cube Root of Ark's Interior Volume

41.4567 / 25 = 1.6582688669996
1.6582688669996^3 = 4.56 Cubic Cubits
for the interior of the Ark.

Assume that 0.075 Cubits (1.875 inches) is a
suitable wall thickness for the Ark's four sides.
The thickenss of the base would then be
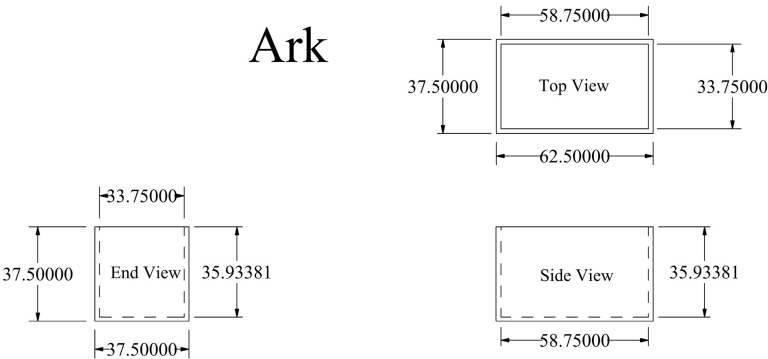.06265+ Cubits or 1.56625+ inches.
The interior dimensions (in Cubits) would be:
1.35 W x 2.35 L x 1.43735224586288416+ H
or (in inches):
33.75 W x 58.75 L x 35.9338061465721 H (nearly one yard)

The interior volume is thus 71,250 Cubic Inches -
Equal to that of the Coffer in the Great Pyramid.

The Exterior dimensions of the Ark,
with a 25 inch cubit is:
37.5 W x 62.6 L x 37.5 H

Ark

Top View

58.75000

37.50000

33.75000

62.50000

End View

33.75000

37.50000

35.93381

37.50000

Side View

58.75000

35.93381

W (pyr. In)	L (pyr. In)	H (pyr. In)	Volume		W (Cubits)	Length (Cubits)	Height (Cubits)	Volume	Reference
37.5	62.5	37.5	87890.625	Exterior Measurements of the Tabernacle's Coffer	1.5	2.5	1.5	5.625	Exodus 25:10
26.7050242	77.801397	34.2929256	71250.00651	Interior Measurements of the Coffer	1.068200968	3.11205588	1.371717024	4.560000417	GPP 3: 102

41.45672297   Cube root of Coffer's Volume in Pyramid Inches. This equals the length of the edges of a cube which will have the same volume as the Coffer

1.778446652   Cube root of Ark's Volume in Cubits. This equals the length of the edges of a cube which will have the same volume as the Ark's exterior

23.31063623   Inches per cubit if were were to compare the **Exterior** of the Arc to the **Interior** of the Coffer!

If we assume that the Cubit was 25 inches long in the Tabernacle and the capacities of the Coffer and Ark were the same, We can compute as follows

The cube root of the Coffer's Volume (in inches) divided by 25 would equal the Cube Root of the Ark's Interior Volume

Cube Root of the Coffer's Volume				
41.45672171	25	1.658268868	Cube root of the Ark's Interior Volume	
1.658268868	… Cubed is equal to…	4.56	4.56 Cubic Cubits is the Volume of the Ark of the Covenant.	

Since we are comparing the **INTERIOR of the two objects,** the thickness of the walls and floor of the Ark must be determined.

We don't have a specification for the thickness of the boards in the Scriptures, therefore these must be assumed.

Location of numbers:	Mathematical Functions being computed for this Column
Column A, below	We must first assume thickness of the walls of the Ark, then the thickness of the bottom of the Ark. This computation assumes that the Bottom board of the Ark is surrounded by the four boards that form the Sides of the Ark.
4.56/Column E, below	The Interior Volume divided by the interior Surface area will equal the height of the interior of the Ark.
Height of the Ark minus Column F, below	From this we can derive the thickness of the bottom board by subtracting the Interior Height (in cubits) from the Overall Height of the Ark (1.5 cubits). Then convert this to inches for simplicity.

Various test cases follow.

Thickness of the side boards (Cubits)	Inches	Interior Width (cubits)	Interior Length (Cubits)	Interior surface area in Square Cubits	Interior Height (cubits)	Thckness of bottom (cubits)	
0.075	*1.875*	*1.350*	*2.350*	*3.173*	*1.437*	*0.063*	*The number that was used for the model*
0.072122456179849600	1.803061404496240	1.355755087640300	2.355755087640300	3.193826945302860	1.427754382015040	0.072245617984964	**This will yield nearly equal thicknesses for all boards, but how would you measure them?**
0.070	1.750	1.360	2.360	*3.210*	1.421	0.079	Thicker bottom
0.060	1.500	1.380	2.380	*3.284*	1.388	0.112	"
0.050	1.250	1.400	2.400	*3.360*	1.357	0.143	"
0.040	1.000	1.420	2.420	*3.436*	1.327	0.173	These would be very heavy boards
0.030	0.750	1.440	2.440	*3.514*	1.298	0.202	These would be very heavy boards
0.020	0.500	1.460	2.460	*3.592*	1.270	0.230	These would be very heavy boards
0.080	2.000	1.340	2.340	*3.136*	1.454	0.046	Thinner Bottom
0.090	2.250	1.320	2.320	*3.062*	1.489	0.011	" Probably too thin!
0.100	2.500	1.300	2.300	*2.990*	1.525	-0.025	" Negative Thickness

Here, for convenience, the measurements in the table above are all in Inches (except the 2nd column.)

Thickness of the side boards (inches)	(Cubits)	Interior Width (Inches)	Interior Length (inches)	Interior surface area in Square Inches	Interior Height (Inches)	Thickness of Bottom (Inches)	
1.875	*0.075*	*33.750*	*58.750*	*1982.813*	*35.934*	*1.566*	*The number that was used for the model*
1.803061404496240000	0.0721224561798	33.8938771910075	58.8938771910075	1996.1418408142900	35.6938595503759	1.80614044962409	**This will yield nearly equal thicknesses for all boards, but how would you measure it?**
1.750	0.070	34.000	59.000	2006.000	*35.518*	1.982	Thicker bottom
1.500	0.060	34.500	59.500	2052.750	*34.710*	2.790	"
1.250	0.050	35.000	60.000	2100.000	*33.929*	3.571	"
1.000	0.040	35.500	60.500	2147.750	*33.174*	4.326	These would be very heavy boards
0.750	0.030	36.000	61.000	2196.000	*32.445*	5.055	These would be very heavy boards
0.500	0.020	36.500	61.500	2244.750	*31.741*	5.759	These would be very heavy boards
2.000	0.080	33.500	58.500	1959.750	*36.357*	1.143	Thinner Bottom
2.250	0.090	33.000	58.000	1914.000	*37.226*	0.274	" Probably too thin!
2.500	0.100	32.500	57.500	1868.750	*38.127*	-0.627	" Negative Thickness