

# Triton s Treasures

Kansas K.A.R. 111-23-24 · eInstant Cert Pack v1

Issued: 2026-05-15T21:45:36.220222Z · Authority: Multi.Bingo iLottery RGS  
Signing key: Ed25519 · ID d651f1b9f793f40d

## Math validation

<b>Pool size</b>	1,000,000
<b>RTP @ unit denom</b>	88.0000%
<b>Top prize (max denom)</b>	\$100,000
<b>Bonus engine</b>	generic_bonus

## 1. Game specification (Kansas K.A.R. 111-23-24)

**Triton s Treasures** is an instant lottery game governed by Kansas K.A.R. 111-23-24. Finite-pool model with 1,000,000 shares per pool. The bit-exact payable below has been imported from the K.A.R. (j) odds table.

**Prize formula:**  $\text{prize\_cents} = \text{multiplier} \times \text{denom\_cents} \times \text{tickets\_purchased}$

## 2. Paytable (73 tiers)

Multiplier	Count in pool	Odds (1 in)
×5000.0	1	1,000,000.00
×1000.0	3	333,333.33
×500.0	8	125,000.00
×250.0	23	43,478.26
×100.0	26	38,461.54
×80.0	5	200,000.00
×75.0	10	100,000.00
×70.0	5	200,000.00
×65.0	10	100,000.00
×60.0	40	25,000.00
×55.0	90	11,111.11
×50.0	115	8,695.65
×48.0	30	33,333.33
×47.0	27	37,037.04
×46.0	50	20,000.00
×45.0	110	9,090.91
×43.0	75	13,333.33
×42.0	107	9,345.79
×41.0	95	10,526.32
×40.0	175	5,714.29
×39.0	17	58,823.53
×38.0	37	27,027.03
×37.0	68	14,705.88
×36.0	125	8,000.00
×35.0	325	3,076.92
... (48 more)		

### 3. Pool architecture

Each pool consists of 1,000,000 shares. Pool generation: RGS service `multibingo-rng:9443` provides the server seed (RNG\_STRICT=true, no local fallback). Paytable counts written into array, shuffled with `mulberry32(SHA-256(server_seed))` Fisher-Yates. Pool audit\_hash chained via Ed25519 signature. Tickets consumed sequentially; outcome = multiplier at position in shuffled array.

### 4. Audit chain (K.A.R. h)

Daily Merkle root signed with Ed25519 (key ID `d651f1b9f793f40d`). Leaves = ticket\_hash + pool\_hash. Persisted in WORM-locked PG row + audit blob to disk (S3 Object Lock in prod). Each day's row stores `prev_root_sha256` forming a hash chain.

### 5. Verifier endpoints

```
GET /api/ilottery/games/TRITON_S_TREASURES/paytable
GET /api/ilottery/games/TRITON_S_TREASURES/config?jur=GLI-SANDBOX
POST /api/ilottery/games/TRITON_S_TREASURES/open-pool
POST /api/ilottery/games/TRITON_S_TREASURES/play
POST /api/ilottery/vector/replay (game_code=TRITON_S_TREASURES)
GET /api/ilottery/verify/:ticket_id
GET /api/ilottery/merkle/proof/:ticket_id
GET /api/ilottery/audit/public-key
```

### 6. Test vectors v1

URL: [https://kobowlotto.com/mathforge/ilottery/gdd/triton\\_s\\_treasures/vectors\\_v1.json](https://kobowlotto.com/mathforge/ilottery/gdd/triton_s_treasures/vectors_v1.json)  
600 vectors × 5 denoms = 3,000 prize data points (6 tiers × 100 each).

### 7. Operator Ed25519 public key

```
-----BEGIN PUBLIC KEY-----
MCowBQYDK2VwAyEAU2k0zXnm09QHDuKlSEQYUAFeACAEOTUceEuiRGLSiXs=
-----END PUBLIC KEY-----
```