

# Holiday VIP Riches

Kansas K.A.R. 111-23-7 (v43 synth) · eInstant Cert Pack v1

Issued: 2026-05-15T21:45:40.718919Z · 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>	\$5,000,000
<b>Bonus engine</b>	generic_bonus

## 1. Game specification (Kansas K.A.R. 111-23-7 (v43 synth))

**Holiday VIP Riches** is an instant lottery game governed by Kansas K.A.R. 111-23-7 (v43 synth). 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 (12 tiers)

Multiplier	Count in pool	Odds (1 in)
x50000	1	1,000,000.00
x5000	8	125,000.00
x1000	41	24,390.24
x250	332	3,012.05
x100	664	1,506.02
x50	1,328	753.01
x25	3,320	301.20
x10	9,960	100.40
x5	19,920	50.20
x2	49,800	20.08
x1	83,000	12.05
x0.5	136,800	7.31

### 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/HOLIDAY_VIP_RICHES/paytable
GET /api/ilottery/games/HOLIDAY_VIP_RICHES/config?jur=GLI-SANDBOX
POST /api/ilottery/games/HOLIDAY_VIP_RICHES/open-pool
POST /api/ilottery/games/HOLIDAY_VIP_RICHES/play
POST /api/ilottery/vector/replay (game_code=HOLIDAY_VIP_RICHES)
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/holiday\\_vip\\_riches/vectors\\_v1.json](https://kobowlotto.com/mathforge/ilottery/gdd/holiday_vip_riches/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-----
```