Gold Rush

Kansas K.A.R. 111-23-3 (v43 synth) · eInstant Cert Pack v1

Issued: 2026-05-15T21:45:37.962895Z · Authority: Multi.Bingo iLottery RGS
Signing key: Ed25519 · ID `d651f1b9f793f40d`

Math validation

Pool size	1,000,000
RTP @ unit denom	88.0000%
Top prize (max denom)	$22,500,000
Bonus engine	generic_bonus

1. Game specification (Kansas K.A.R. 111-23-3 (v43 synth))

Gold Rush is an eInstant lottery game governed by Kansas K.A.R. 111-23-3 (v43 synth). Finite-pool model with 1,000,000 shares per pool. The bit-exact paytable below has been imported from the K.A.R. (j) odds table.
Prize formula: prize_cents = multiplier × denom_cents × tickets_purchased

2. Paytable (13 tiers)

Multiplier	Count in pool	Odds (1 in)
×225000	1	1,000,000.00
×22500	1	1,000,000.00
×4500	7	142,857.14
×1125	29	34,482.76
×250	131	7,633.59
×100	524	1,908.40
×50	1,048	954.20
×25	2,620	381.68
×10	7,860	127.23
×5	15,720	63.61
×2	39,300	25.45
×1	65,500	15.27
×0.5	128,050	7.81

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/GOLD_RUSH/paytable
GET /api/ilottery/games/GOLD_RUSH/config?jur=GLI-SANDBOX
POST /api/ilottery/games/GOLD_RUSH/open-pool
POST /api/ilottery/games/GOLD_RUSH/play
POST /api/ilottery/vector/replay (game_code=GOLD_RUSH)
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/gold_rush/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-----
```