Risk of Ruin & Drawdown Recovery Cheat Sheet

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Core principle: Drawdown loss and recovery gain are mathematically asymmetric. Capital preservation before a losing streak dominates return chasing after one. All rules below are currency-agnostic (% and R-multiples).

1. DRAWDOWN RECOVERY ASYMMETRY

```
Required Gain Z = DD ÷ (1 − DD)
```

Drawdown	Remaining	Gain to Break Even	Loss of 1R @ 1%
−5%	95%	**+5.3%**	5 losses
−10%	90%	**+11.1%**	10 losses
−20%	80%	**+25.0%**	20 losses
−30%	70%	**+42.9%**	30 losses
−40%	60%	**+66.7%**	40 losses
−50%	50%	**+100.0%**	50 losses
−60%	40%	**+150.0%**	60 losses
−75%	25%	**+300.0%**	75 losses
−90%	10%	**+900.0%**	90 losses

2. SIZING & NET EXPECTANCY FORMULAS

```
Risk Budget ($) = Equity × (Risk% ÷ 100)
```

```
Risk/Lot = (SL + Spread + Slippage) × PipVal + Comm
```

```
Lots = floor(Risk Budget ÷ Risk/Lot, step)
```

```
Net Expectancy (R) = p·AvgWinR − (1−p)·AvgLossR − CostR
```

```
Break-Even WR% = 100 × (AvgLossR + CostR) ÷ (AvgWinR + AvgLossR)
```

```
1:1 Infinite Ruin (p>0.5): P_ruin = ((1 − p) ÷ p)^N
```

- **Always round lots DOWN** to broker volume step (`0.01`); rounding up breaches your risk ceiling.
- **Negative expectancy (E_net ≤ 0):** infinite-horizon ruin probability is 100% regardless of how small position size is.
- **1R definition:** total planned monetary stop-out risk including spread & commission before entry.

3. LOSING STREAK DRAWDOWN (FRACTIONAL COMPOUNDING)

Risk / Trade	5 Losses	10 Losses	15 Losses	20 Losses
0.50%	−2.5%	−4.9%	−7.2%	−9.5%
1.00%	−4.9%	−9.6%	−14.0%	−18.2%
2.00%	−9.6%	−18.3%	−26.1%	−33.2%
3.00%	−14.1%	−26.3%	−36.7%	−45.6%
5.00%	−22.6%	−40.1%	−53.7%	−64.2%

Formula: `1 − (1 − r)^k` assuming fixed fractional sizing & zero gap slippage.

4. DESK KILL-SWITCH & EXPOSURE GUARDRAILS

- **Daily loss cap (e.g. −2R / −3R):** hard platform shutdown for the session; prevents tilt escalation.
- **Weekly loss cap (e.g. −5R):** pause live execution until a full journal & mistake audit completes.
- **Portfolio heat check:** never treat Long EUR/USD + Short USD/CHF + Long GBP/USD as three independent bets — all three carry short USD correlation risk.
- **Never risk more after a loss (anti-Martingale):** shrink notional linearly or proportionally during drawdown; add deposits only as non-performance cash flows.

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