

DÉTAILS AU VERSO • DETAILS ON THE BACK

TYPE DE MISE	1	11	21	31	41	51	61
2	2	12	22	32	42	52	62
3	3	13	23	33	43	53	63
4	4	14	24	34	44	54	64
5	5	15	25	35	45	55	65
6	6	16	26	36	46	56	66
7	7	17	27	37	47	57	67
8	8	18	28	38	48	58	68
9	9	19	29	39	49	59	69
10	10	20	30	40	50	60	70

1\$

2\$

5\$

10\$

NUJ

MISE-ÉCLAIR
QUICK PICK

lotto-québec

RAMBO
Extra

A

TYPE DE MISE	Numéros gagnants <i>Winning Numbers</i>	Catégorie <i>Category</i>	LOT* <i>PRIZE*</i>
10	10	10/10	200 000 \$
	9	9/10	5 000 \$
	8	8/10	200 \$
	7	7/10	25 \$
	6	6/10	5 \$
9	9	9/9	50 000 \$
	8	8/9	1 000 \$
	7	7/9	100 \$
	6	6/9	5 \$
8	8	8/8	25 000 \$
	7	7/8	200 \$
	6	6/8	10 \$
7	7	7/7	5 000 \$
	6	6/7	50 \$
	5	5/7	5 \$
6	6	6/6	1 000 \$
	5	5/6	25 \$
5	5	5/5	250 \$
	4	4/5	5 \$
4	4	4/4	100 \$
3	3	3/3	25 \$
2	2	2/2	7 \$

BANCO is governed by the REGULATION RESPECTING FORECAST CONTESTS AND NUMBERS published in the GAZETTE OFFICIELLE DU QUÉBEC, which includes limitations of liability.

HOW TO PLAY:

- For each selection, complete one of the boards appearing in front, in the following manner:
 1. Mark how many numbers you want to play in the column "TYPE DE MISE".
 2. Mark the numbers of the selection from the numbers 1 to 70 or check the QUICK PICK button.
 3. Indicate the amount wagered on the selection (\$1, \$2, \$5, \$10).
- Indicate the number of draws for which the selection(s) will be valid.
- To obtain a ticket, present to an authorized retailer the selection slip duly completed and appropriate amount.
- Before leaving the point of sale, verify the information on your ticket.

DRAW: On each draw date, or as soon as possible after that date, Loto-Québec will cause 20 numbers between 1 and 70 to be drawn.

WINNING SELECTION: To be a winning selection, out of the 20 numbers drawn, the selection must include the number indicated in the left chart, in the "Winning Numbers" column. Any valid selection bearing any winning selection as defined on the chart, entitles the lawful holder to a prize as defined according to the selected "TYPE DE MISE".

EXTRA is governed by the applicable regulation, which includes limitations of liability. The rules of the game are available from Loto-Québec upon request.

To participate, mark the number of Extra number(s) desired on the front of this slip and pay \$1.00 per number, per draw. If these conditions are met, "EXTRA" and the day(s) of the draw will appear on the ticket above the six-digit number(s) generated for the Extra draw. If these conditions are not met, "EXTRA NON PARTICIPANT" will appear on the ticket above the six-digit number and you do not participate in the Extra draw.

PRIZE CLAIM: Prizes must be claimed within one year of the draw date as indicated on the back of the ticket. Loto-Québec reserves the right to publish the name, address and photograph of any winner.

Only the "Banco" selections and the "Extra" numbers recorded by the central computer system participate in the games.

* **PRIZE:** For each dollar wagered. However, Loto-Québec may, at any time, at its discretion, limit the prize amount payable for a category to \$4,000,000. In such cases, the prizes of the category will be determined in proportion to the amounts wagered on the winning selections of the category.

The sale of lottery tickets to minors is forbidden by law.

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Player's Expected Winnings from Ioto-québec's Banco®
as a function of how many numbers (n) played

n	x : number correct										Σ	
	0	1	2	3	4	5	6	7	8	9		10
1	0.714	0.286										1.000
2	0.507	0.414	0.079									1.000
3	0.358	0.448	0.174	0.021								1.000
4	0.251	0.428	0.254	0.062	0.005							1.000
5	0.175	0.381	0.308	0.115	0.020	0.001						1.000
6	0.121	0.323	0.334	0.170	0.045	0.006	0.0003					1.000
7	0.083	0.265	0.336	0.219	0.079	0.016	0.002	6E-05				1.000
8	0.057	0.212	0.320	0.256	0.118	0.032	0.005	0.0004	1E-05			1.000
9	0.039	0.165	0.292	0.279	0.158	0.055	0.012	0.001	1E-04	3E-06		1.000
10	0.026	0.126	0.257	0.287	0.194	0.083	0.023	0.004	0.0004	2E-05	5E-07	1.000

<-- PROBABILITIES:
Prob(x/n)

n	W (x / n)											
	0	1	2	3	4	5	6	7	8	9	10	
1	-	-										-
2	-	-	7									-
3	-	-	-	25								-
4	-	-	-	-	100							-
5	-	-	-	-	5	250						-
6	-	-	-	-	-	25	1000					-
7	-	-	-	-	-	5	50	5000				-
8	-	-	-	-	-	-	10	200	25000			-
9	-	-	-	-	-	-	5	100	1000	50000		-
10	-	-	-	-	-	-	5	25	200	5000	200000	-

<--- \$Win if get x / n correct

n	W (x / n) • Prob(x / n)											
	0	1	2	3	4	5	6	7	8	9		10
1	-	-										-
2	-	-	0.551									\$0.55
3	-	-	-	0.521								\$0.52
4	-	-	-	-	0.528							\$0.53
5	-	-	-	-	0.100	0.320						\$0.42
6	-	-	-	-	-	0.148	0.296					\$0.44
7	-	-	-	-	-	0.079	0.081	0.323				\$0.48
8	-	-	-	-	-	-	0.050	0.082	0.334			\$0.47
9	-	-	-	-	-	-	0.058	0.146	0.097	0.129		\$0.43
10	-	-	-	-	-	-	0.113	0.096	0.078	0.106	0.093	\$0.49

n	PROBABILITIES: Prob(x / n)											
	0	1	2	3	4	5	6	7	8	9		10
1	0.714	0.286										1.000
2	0.510	0.408	0.082									1.000
3	0.364	0.437	0.175	0.023								1.000
4	0.260	0.416	0.250	0.067	0.007							1.000
5	0.186	0.372	0.297	0.119	0.024	0.002						1.000
6	0.133	0.319	0.319	0.170	0.051	0.008	0.0005					1.000
7	0.095	0.266	0.319	0.212	0.085	0.020	0.003	0.0002				1.000
8	0.068	0.217	0.304	0.243	0.121	0.039	0.008	0.0009	4E-05			1.000
9	0.048	0.174	0.279	0.260	0.156	0.062	0.017	0.003	0.0003	1E-05		1.000
10	0.035	0.138	0.249	0.266	0.186	0.089	0.030	0.007	0.001	9E-05	4E-06	1.000

if use the binomial
with = 20/70
[rather than
hypergeometric]

Illustration of

- (1) Several Hypergeometric Distributions (1 per row)
- (2) Expectation of a random variable (1 example per row)
- (3) Binomial approximation to hypergeometric (1 example per row)

Note: probabilities calculated recursively (hypergeometric probabilities not in earlier Excel versions)

October 7, 1989

The Editor
Montréal Gazette

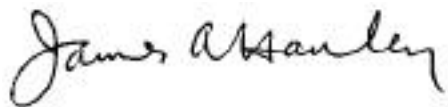
Dear Sir:

In addition to reporting the results of loto-québec's draws, please let the playing public know what percentages of the bets are returned in prizes and what percentages are retained by loto-québec. By my calculations, the amounts won by players and retained by loto-québec in the recently introduced and highly advertized Banco® lottery are as follows:

If player plays...	On average, for every \$1.00 (s)he plays, (s)he can expect to win...	and so, loto-québec will keep...
2 numbers	\$0.55	\$0.45
3 numbers	\$0.52	\$0.48
4 numbers	\$0.53	\$0.47
5 numbers	\$0.42	\$0.58
6 numbers	\$0.44	\$0.56
7 numbers	\$0.48	\$0.52
8 numbers	\$0.47	\$0.53
9 numbers	\$0.43	\$0.57
10 numbers	\$0.49	\$0.51

In summary, depending on whether one aims at small prizes or large, the payoff ranges somewhere between 42% and 55%. Looked at the other way, the revenue to loto-québec varies from 45¢ to 58¢ from every dollar played. Few government taxation schemes can match this.

Yours sincerely,



James A Hanley