FIDE Handbook

10.0. The working of the FIDE Rating System

The FIDE Rating system is a numerical system in which percentage scores are converted to rating differences and vice versa. Its function is to produce scientific measurement information of the best statistical quality.

10.1 The rating scale is an arbitrary one with a class interval set at 200 points. The tables that follow show the conversion of percentage score \`p\` into rating difference \`$d_p$\`. For a zero or 100% score dp is necessarily indeterminate. The second table shows conversion of difference in rating \`D\` into scoring probability \`$P_D$\` for the higher \`H\` and the lower \`L\` rated player respectively. Thus the two tables are effectively mirror-images.

a. The table of conversion from percentage score, p, into rating differences, d_p

p	**d_p**	**p**	**d_p**	**p**	**d_p**	**p**	**d_p**	**p**	**d_p**	**p**	**d_p**
1.0		.83	273	.66	117	.49	-7	.32	-133	.15	-296
.99	677	.82	262	.65	110	.48	-14	.31	-141	.14	-309
.98	589	.81	251	.64	102	.47	-21	.30	-149	.13	-322
.97	538	.80	240	.63	95	.46	-29	.29	-158	.12	-336
.96	501	.79	230	.62	87	.45	-36	.28	-166	.11	-351
.95	470	.78	220	.61	80	.44	-43	.27	-175	.10	-366
.94	444	.77	211	.60	72	.43	-50	.26	-184	.09	-383
.93	422	.76	202	.59	65	.42	-57	.25	-193	.08	-401
.92	401	.75	193	.58	57	.41	-65	.24	-202	.07	-422
.91	383	.74	184	.57	50	.40	-72	.23	-211	.06	-444
.90	366	.73	175	.56	43	.39	-80	.22	-220	.05	-470
.89	351	.72	166	.55	36	.38	-87	.21	-230	.04	-501
.88	336	.71	158	.54	29	.37	-95	.20	-240	.03	-538
.87	322	.70	149	.53	21	.36	-102	.19	-251	.02	-589
.86	309	.69	141	.52	14	.35	-110	.18	-262	.01	-677
.85	296	.68	133	.51	7	.34	-117	.17	-273	.00	
.84	284	.67	125	.50	0	.33	-125	.16	-284		

b. Table of conversion of difference in rating, D, into scoring probability P_D, for the higher, H, and the lower, L, rated player respectively.

D	**P_D**		**D**	**P_D**		**D**	**P_D**		**D**	**P_D**	
Rtg Dif	H	L	Rtg Dif	H	L	Rtg Dif	H	L	Rtg Dif	H	L
0-3	.50	.50	92-98	.63	.37	198-206	.76	.24	345-357	.89	.11
4-10	.51	.49	99-106	.64	.36	207-215	.77	.23	358-374	.90	.10
11-17	.52	.48	107-113	.65	.35	216-225	.78	.22	375-391	.91	.09
18-25	.53	.47	114-121	.66	.34	226-235	.79	.21	392-411	.92	.08
26-32	.54	.46	122-129	.67	.33	236-245	.80	.20	412-432	.93	.07
33-39	.55	.45	130-137	.68	.32	246-256	.81	.19	433-456	.94	.06
40-46	.56	.44	138-145	.69	.31	257-267	.82	.18	457-484	.95	.05
47-53	.57	.43	146-153	.70	.30	268-278	.83	.17	485-517	.96	.04
54-61	.58	.42	154-162	.71	.29	279-290	.84	.16	518-559	.97	.03
62-68	.59	.41	163-170	.72	.28	291-302	.85	.15	560-619	.98	.02
69-76	.60	.40	171-179	.73	.27	303-315	.86	.14	620-735	.99	.01
77-83	.61	.39	180-188	.74	.26	316-328	.87	.13	over 735	1.0	.00
84-91	.62	.38	189-197	.75	.25	329-344	.88	.12			

10.2 Determining the Rating \`$R_u$\` in a given event of a previously unrated player.

10.21 If an unrated player scores less than one point in his first rated event, his score is disregarded.

First determine the average rating of his competition \`$R_c$\`. (GA \`94)

a. In a Swiss or Team tournament: this is simply the average rating of his opponents.
b. The results of both rated and unrated players in a round robin tournament are taken into account. For unrated players, the average rating of the competition \`$R_c$\` is also the tournament average \`$R_a$\` determined as follows: (GA \`94)
    i. Determine the average rating of the rated players \`Rar\`.
    ii. Determine p for each of the rated players against all their opponents. Then determine dp for each of these players. Then determine the average of these dp = \`dpa\`.

iii. `n` is the number of opponents.
$R_a = R_{ar} - d_{pa} \times n/(n+1)$

10.22 If he scores 50%, then $R_u = R_c$. (GA `94)

10.23 If he scores more than 50%, then $R_u = R_c + 12.5$ for each half point scored over 50%. (GA `94)

10.24 If he scores less than 50% in a Swiss or team tournament (GA `94):

$R_u = R_c + d_p$.

10.25 If he scores less than 50% in a round-robin (GA `94):

R(u) = R(c) + d(p) x n/(n+1).

10.3 The Rating R_n which is to be published for a previously unrated player is then determined by taking the weighted average of all his R_u results. e.g. A player has R_u results of 2280 over 5 games, 2400 over 10 games and 2000 over 5 games:

R_n = [2280 x 5 + 2400 x 10 + 2000 x 5] / 20 = 2270.

10.31 Where a player`s first result(s) is less than 1401, or the FIDE rating floor at the time of the event, the result(s) is ignored. (GA 2005)

10.32 R_n for the FIDE Rating list (FRL) is rounded off to the nearest 1 or zero.

10.33 Only R_n>= 1401, or the FIDE rating floor at the time of the event, are considered. (GA 2005)

10.4 If an unrated player receives a published rating before a particular tournament in which he has played is rated, then he is rated as a rated player with his current rating, but in the rating of his opponents he is counted as an unrated player.

10.5 Determining the rating change for a rated player:

10.51 For each game played against a rated player, determine the difference in rating between the player and his opponent, D.

A difference in rating of more than 350 points shall be counted for rating purposes as though it were a difference of 350 points (compare 10.54).

(a) Use table B.02.10.1(b) to determine the player-s score probability P_D

(b) ΔR = score - P_D. For each game, the score is 1, 0.5 or 0.

(c) $\Sigma\Delta R$ x K = the Rating Change for a given tournament, or Rating period.

10.52 K is the development coefficient.
K = 25 for a player new to the rating list until he has completed events with a total of at least 30 games.
K = 15 as long as a player`s rating remains under 2400.
K = 10 once a player`s published rating has reached 2400, and he has also completed events with a total of at least 30 games. Thereafter it remains permanently at 10.

10.53 Rn is rounded off to the nearest 1 or 0.

10.54 Determining the Ratings in a round-robin tournament.
Where unrated players take part, their ratings are determined by a process of iteration. These new ratings are then used to determine the rating change for the rated players.
What follows shows the methodology.

Player	Rate	W	p	dp	Rc	dp	Ru	Rc new	Ru new
A	2600	8	.89	351					
B	2500	7	.78	220					
C	u	7			2348		2411	2351	2414
D	2400	6	.67	125					
E	u	6			2348		2386	2348	2386
F	2150	4	.44	-43					
G	2300	3	.33	-125					
H	u	2			2348	-220	2150	2337	2139
I	u	1			2348	-351	2032	2305	1989
J	2300	1	.11	-351					

Rar = 2600 + 2500 + 2400 + 2150 + 2300 + 2300 divided by 6
Rar = 2375
dpa = 351 + 220 + 125 - 43 - 125 - 351 divided by 6

dpa = 29.5
Ra = 2375 - 29.5 x 9/10
Ra = 2348

For Player C	Ru = 2348	+ 5 x 12.5	= 2411
For Player E	Ru = 2348	+ 3 x 12.5	= 2386
For Player H	Ru = 2348	- 220 x 0.9	= 2150
For Player I	Ru = 2348	- 351 x 0.9	= 2032

However, Player I is more than 350 points below players A, B, C, D, E.
Player H is more than 350 points below Player A.

Player C, I	counts as 2061. 2061-2032 = 29. 29/9=3.	**Rc(new) =2351**
Player E, I	counts as 2036	**Rc(new) =2348**
Player H, A	counts as 2500	**Rc(new) =2337**
Player I, A,B,C,D,E	counts as 2382	**Rc(new) =2305**

Then the ΔR for each of the rated players for each game is determined using R_u(new) as if an established rating.

F was a poor choice of player for the tournament. He dragged down the average rating too much. If a plyer rated 2380 or higher had replaced him, C would achieve a better rating even with one point less. This is because, for unrated players with plus scores the average rating of the field is extremely important. Had I`s expected score been so poor, he should not have been chosen, everybody suffered.