



Problem of the Week

Problem B and Solution

Citius, Altius, Fortius

Problem

Consider the winter Olympic sports of downhill skiing and 1500 metre speed skating, which have recorded numeric results. In the table below are the gold medalist times for men and women in these events in the ten Winter Olympics since 1980 (from the website <https://www.olympic.org/sports>).

Year	Downhill Skiing		Speed Skating	
	Men	Women	Men	Women
1980	1:45.50	1:37.52	1:55.44	2:10.95
1984	1:45.59	1:13.36	1:58.36	2:03.42
1988	1:59.63	1:25.86	1:52.06	2:00.68
1992	1:50.37	1:52.55	1:54.81	2:05.87
1994	1:45.75	1:35.93	1:51.29	2:02.19
1998	1:50.11	1:28.89	1:47.87	1:57.58
2002	1:39.13	1:39.56	1:43.95	1:54.02
2006	1:48.80	1:56.49	1:45.97	1:55.27
2010	1:54.31	1:44.19	1:45.57	1:56.89
2014	2:06.23	1:41.57	1:45.006	1:53.51

- How many times has the winning time improved in each sport from one Olympics to the next, and what was the greatest improvement?
- How much faster is the most recent record-breaking time than the 1980 winning time for each sport? Who achieved this fastest time?
- Create two graphs (one for each sport) of the winning times over these ten Winter Olympics. Use whichever type of graph you think will best display the data.

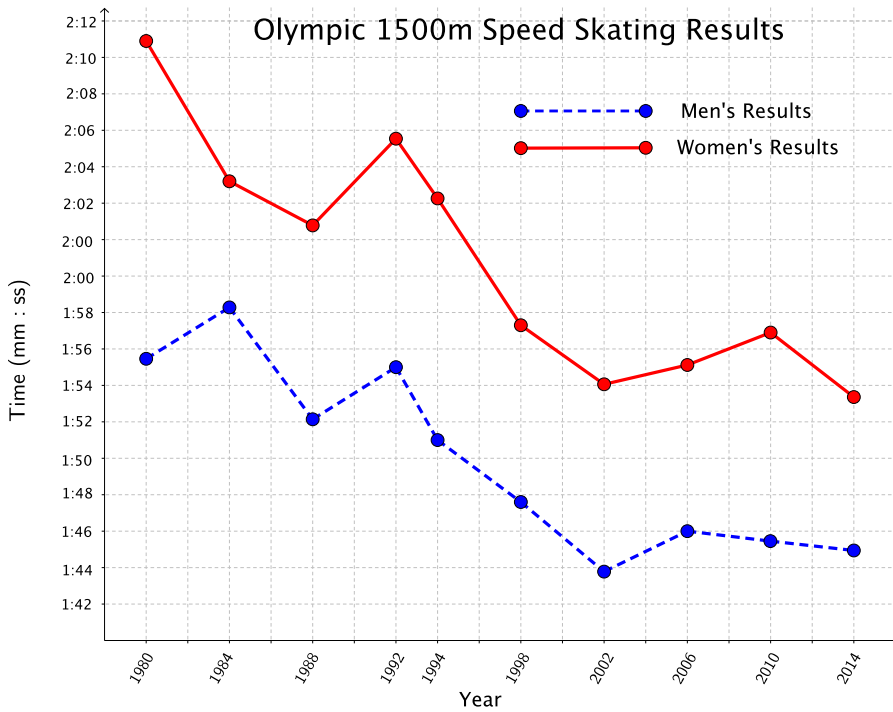
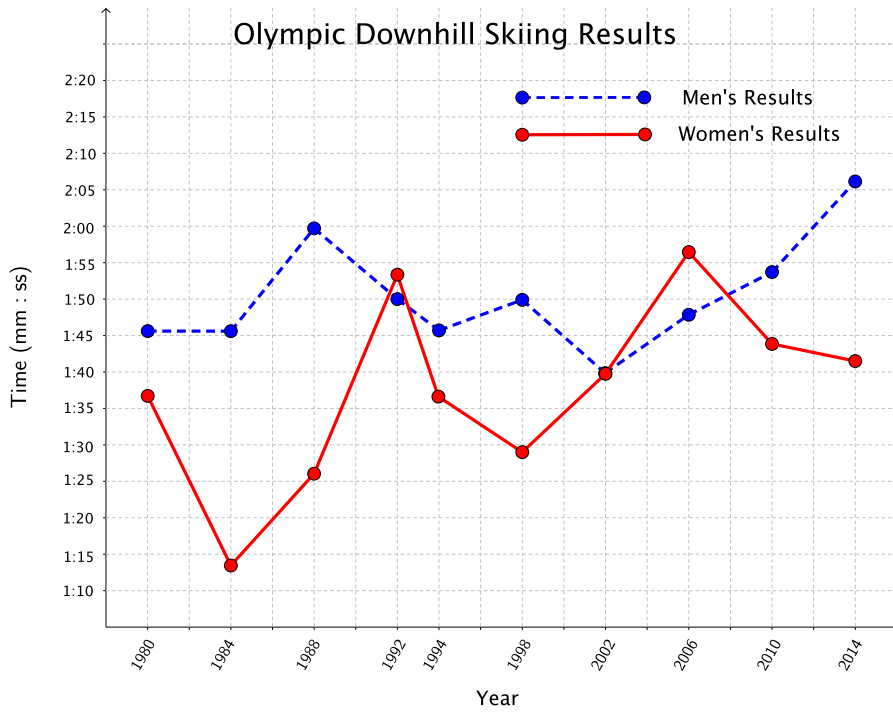
Solution

- In downhill skiing, the men's times improved three times, the greatest being 10.98 seconds from 1998 to 2002; the women's times improved five times, the greatest being 24.16 seconds from 1980 to 1984.
In speed skating, the men's times improved six times, the greatest being 6.30 seconds from 1984 to 1988; the women's times improved six times, the greatest being 7.53 seconds from 1980 to 1984.
- In downhill skiing, the men's most recent record-breaking time, achieved by Fritz Strobl of Austria in 2002, was 1:39.13, 6.37 seconds faster than 1980; the women's most recent record-breaking time, achieved by Michela Figini of Switzerland in 1984, was 1:13.36, 24.16 seconds faster than 1980.
In speed skating, the men's most recent record-breaking time, achieved by Derek Parra of the USA in 2002, was 1:43.95, 11.49 seconds faster than 1980; the women's most recent record-breaking time, achieved by Jorien Ter Mors of the Netherlands in 2014, was 1:53.51, 17.44 seconds faster than 1980.





c) Here are the required graphs



EXTENSION:

Do some research and write a paragraph about why these changes in winning times have occurred.

