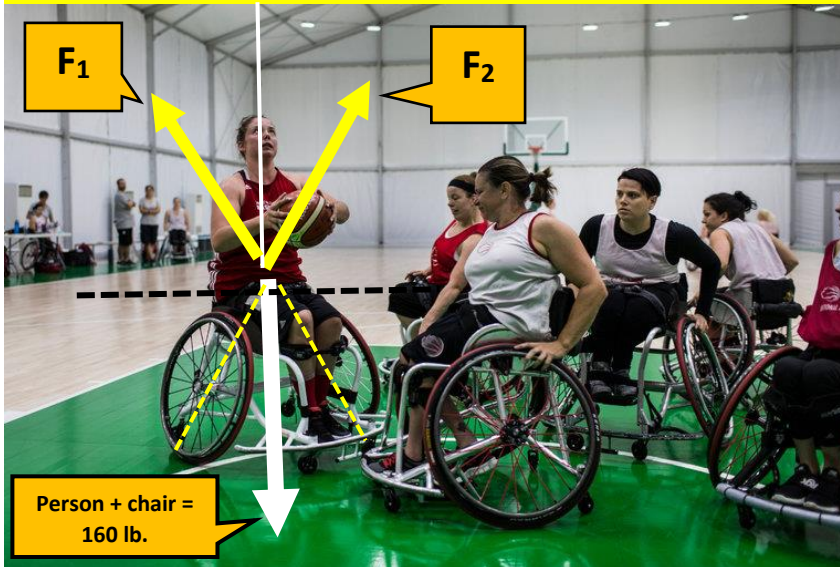


# STATICS

Sports application of Physics, Unit 3 Dr. John P. Cise, Professor of Physics, Austin Com.

College, 1212 Rio Grande St., Austin Tx. 78701 [jpcise@austincc.edu](mailto:jpcise@austincc.edu) , New York Times Sept. 10, 2016 by Ben Shpigel

## Keeping Ahead in Arms Race for the Perfect Wheelchair



**INTRODUCTION:** To be in static equilibrium sum of forces in X & Y direction = 0 :  $\Sigma F_x = 0$  ,  $\Sigma F_y = 0$

The wheelchair wheels at left are each at  $53^\circ$  to the horizontal.

**QUESTION:** Find floor forces  $F_1$  &  $F_2$  on chair wheels?

**HINT:** Two unknowns requires setting up two equations.

**ANSWERS:**  $F_1 = F_2 = 100$  lb.

The Canadian women's wheelchair basketball team practicing at the Paralympics in Rio de Janeiro. RIO DE JANEIRO — The Paralympic wheelchair basketball competition had not even begun, and Mike Frogley was already thinking about the next one. And the one after that. As the high-performance director for Wheelchair Basketball Canada, Frogley oversees initiatives intended to ensure — and maintain — his nation's excellence on the international stage. He thinks he knows how the athletes' chairs will look at the 2020 Games in Tokyo, he said, and he has started projecting for 2024 as well. " This competition within the competition has established a divide within the sport. The nations that have access to better materials, a commitment to research and development and the funding to follow projects from conception to completion are positioned to remain global powers. Those who do not are lagging forever behind. In theory, all wheelchairs should be customized to players' specifications, accounting for their sizes, disabilities, positions and weights, and should promote stability and balance without sacrificing agility. Modest adjustments to the wheels' angle or width can improve maneuverability and speed. Stronger aluminum augments strength and durability, without adding weight. A modified seat generates power. Almost all of those changes, which can be critical to a high-level player's performance, are imperceptible to the untrained eye. A fully outfitted chair made of the highest-quality materials, players said, can cost \$5,000 to \$7,500 — far beyond the means of many athletes, and even some federation budgets.