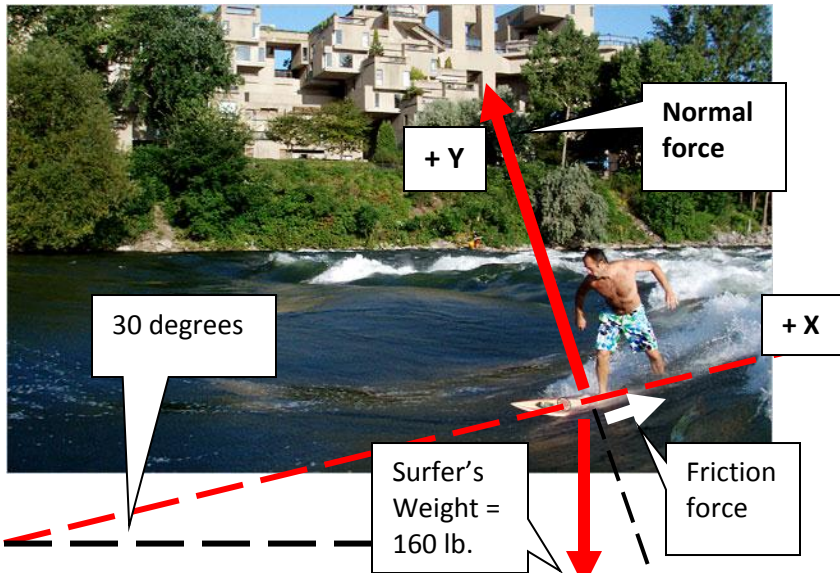


NEWTON'S 2ND LAW

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Surfing a River When the Wave Doesn't Move



Intoduction: The acceleration of this Standing wave surfer is zero.

Questions: (a) Sketch the components of all the forces on this river surfer. Then, find all the force components in the X & Y direction? (b) Find the frictional force due to water friction ON surfboard? Use Newton's 2nd law in the solution. (c) Find the coefficient of kinetic friction between surfboard and water. Hint: Be sure to show all concepts used in the solutions.

Answers: (a) _____ (b) ~ 80 lb. (c) ~ 0.577

Near Habitat 67 in Montreal, created by water flowing over a depression.

TO the uninitiated, the scene on a recent morning along the St. Lawrence River in [Montreal](#) might have inspired confusion. Behind the striking modular apartment complex known as Habitat 67, a crowd of [surfers](#) slipped into wet suits and waxed up their boards, 500 miles from the nearest ocean beach. They were **preparing to surf a**

standing river wave in the St. Lawrence, where high-velocity water roars over a steep river-bottom depression, pitches back and upward, and creates a waist-to-overhead breaker. Surfers paddle into it or swing out by rope to catch the green-faced wedge, rewarded by a

seemingly endless ride. **“Once you’re carving, it’s exactly the same feel as on an ocean wave,”** said Chris Dutton, the founder of the Web site [surfmtl.com](#), “except that instead of going straight down the line, you carve a little bit, flip around, carve back, and can go all day.” **Modern river surfing on standing waves** evolved on the Eisbach River in Germany in the mid-1970s. Tidal bores have been ridden for years on the Severn in England; in Bordeaux, France; and on the Amazon. **New standing waves are being pioneered almost daily** in rivers in places like Colorado, and in Ontario and Alberta in Canada. Though river surfing is in its infancy, the familiar complaints of overcrowding are already being heard. Mr. Addison and others have turned to **creating their own river waves** using artificial obstacles. In 1997, he helped design a wave park in Valley Field, [Quebec](#), now an Olympic kayak-training center. A similar whitewater park on the Arkansas River in Pueblo, Colo., has become a destination for river surfers.