

## Answer #73

The answer is (c): the car will rotate 180 degrees and stop with its rear end pointed forward, as seen in an mpeg video by clicking your mouse on the photograph below.



The reason for this is that sliding friction is less than rolling friction, which is static friction for the case of the tires rolling on the road. (A point on the tire contacts only one point on the road as the tire rolls without sliding.) The car will align itself such that the tires with the lesser friction lead, while the tires with the greater friction lag.

This idea was given much prominence in the case of the GM X-cars, the first generation of General Motors front wheel drive cars. When the drive was introduced to the front wheels, it was necessary to increase the braking on the front wheels and reduce it for the rear wheels. This prevented the rear wheels from locking up when the car was braked, which would cause the car to rotate front-to-rear as seen in the demonstration video. A law suit claimed that GM did not reduce the rear braking sufficiently, causing the rear brakes to lock and leading to a number of serious accidents. The case was settled some fifteen years later in favor of GM.

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[Archive 4](#)

[Question of the Week](#)

[Outreach Index Page](#)

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