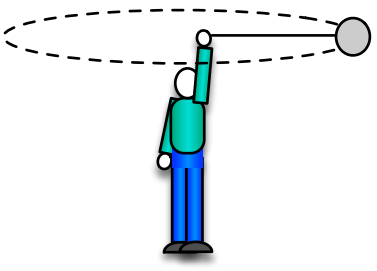
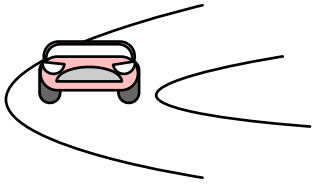
Cycle 20 Circular Motion

Centripetal Force

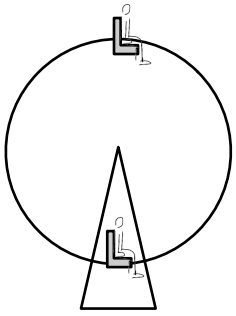


1. The person is whirling a 4 kg ball around a circle at at constant 3 m/s. The radius of the circle is 2 m. What is the tension in the string?

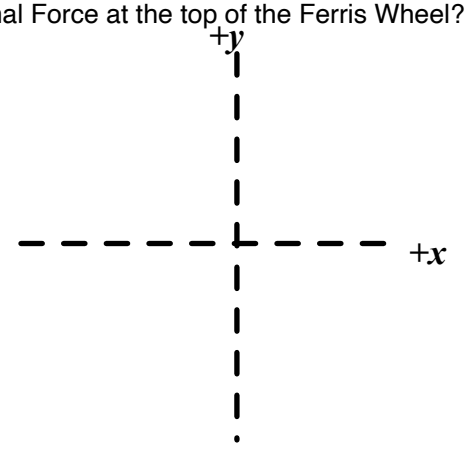


2. The 1,500 kg car rounds the corner at 18 m/s. How much friction is required? The radius of the turn is 40 m.

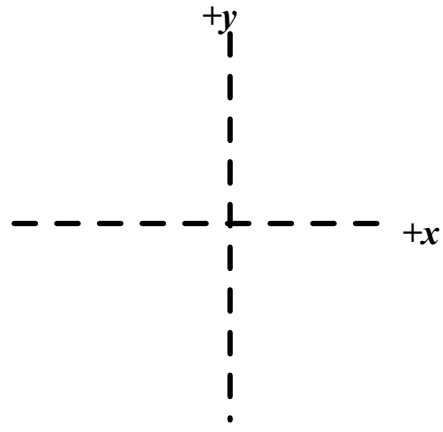
[DU Problem] Calculate the force of gravity between the Earth and Moon. The moon circles the Earth once every 28 days. The radius of the Moon's orbit is 383,000,000 m. The Moon's mass is 7.35 x 10^{22} kg. (Hint: look up how many seconds are in a day.)



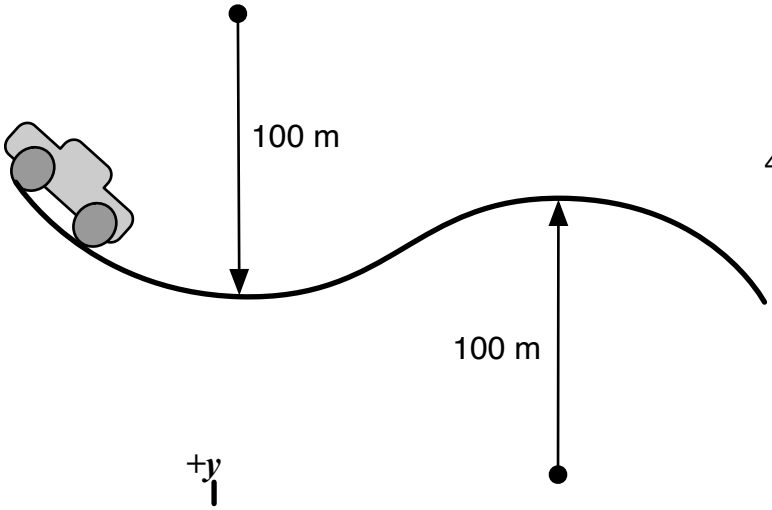
3. The 50 kg person is moving at 3 m/s around a Ferris Wheel whose radius is 18 m.
   a) What is the required centripetal force?
   b) What is the Normal Force at the bottom of the Ferris Wheel?
   c) What is the Normal Force at the top of the Ferris Wheel?



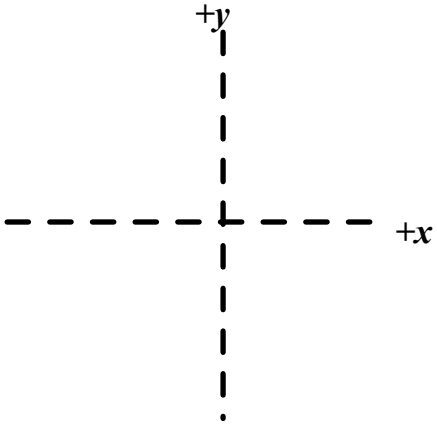
bottom of Ferris Wheel



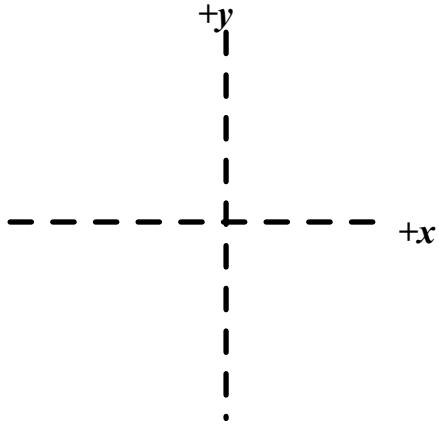
top of Ferris Wheel



4. The 500 kg car is moving at a constant 20 m/s.
   a) What is the required centripetal force?
   b) What is the Normal Force at the bottom of the hill?
   c) What is the Normal Force at the top of the hill?



bottom of hill



top of hill