1.5 g's felt

7 m

21.12 m/s

Circular Loop

13.10 m/s

5 m

35 m

21.12 m/s

Spiral of Archimedes Loop

41. For the circular loop, how many g's are felt by the rider at the bottom of the loop as they enter the loop? (7.5 g's)

43. For the circular loop, how fast is the roller coaster car traveling at the top of the loop? (12.10 m/s)

44. For the Spiral of Archimedes loop, how many g's are felt by the rider at the top of the loop as they enter the loop? (2.5 g's)

45. For the Spiral of Archimedes loop, how many g's are felt by the rider at the bottom of the loop as they enter the loop? (2.3 g's

46.

How fast is the car traveling if the passenger's feel 1.5 g's at the bottom of the road's dip.

(20.41 m/s)

85 m
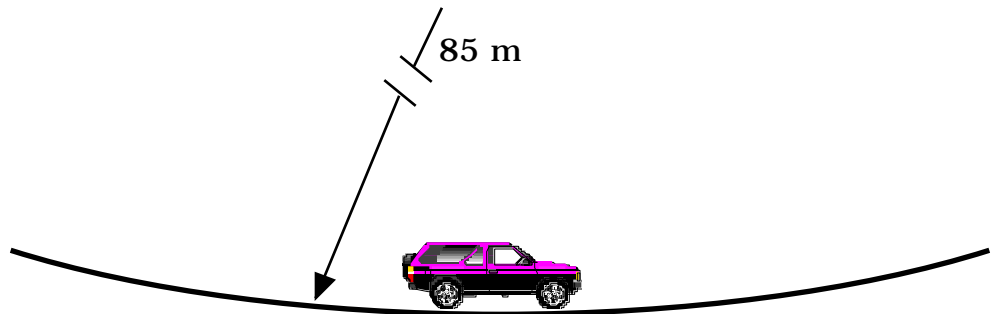
47.

How many g's does the child on the swing feel if they are traveling as shown at the right. (1.32 g's)

2.0 m

2.5 m/s
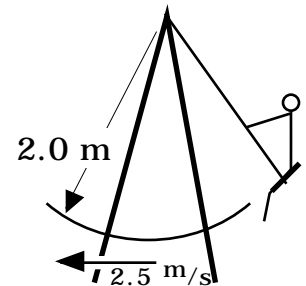
48. A roller coaster travels in a circular loop of radius 5.0 m. At the bottom of the loop the roller coaster car is traveling 25.00 m/s. At the top of the loop the roller coaster car is traveling 20.17 m/s.

$v = 20.17 \, m/s$

$r = 5.0 \, m$

$v = 25 \, m/s$
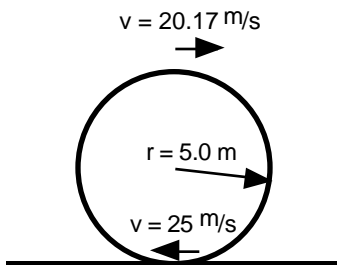
a What is the centripetal acceleration exerted by the track at the top and the bottom of the loop in g's.

b How many g's are **felt** by the rider at the top and the bottom of the loop?

49. A roller coaster travels in a loop whose shape is irregular. The shape is called the spiral of Archimedes or Clothoid. The spiral of Archimedes is a circular shape whose radius changes as its height increases. This spiral has a radius of 5 m at the top.

$r = 5 \, m$

$r = ???$

$v = 30 \, m/s$

Spiral of Archimedes
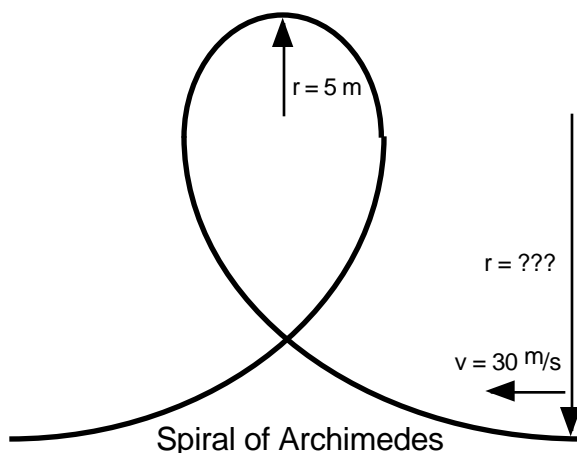
a What is the centripetal acceleration exerted on the rider by the track at the top of the loop if the rider is traveling 20 m/s at the top in m/s^2.

b How many g's are FELT by the rider at the top of the loop?

c If the track is to be designed so that the same number of g's are to be FELT by the rider at the bottom of the track, what must the radius be?

d If the rider's mass is 70 kg, What centripetal force is exerted on the rider at the bottom?