Read 5.2

H.w 4 Due today

H.w 5 available

Lots of office hours today

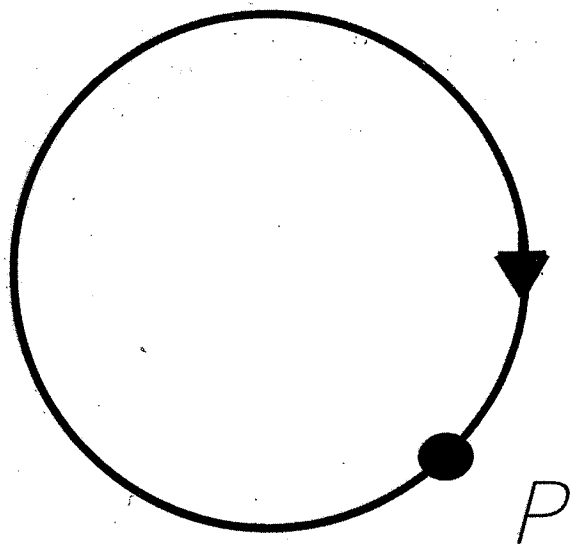
me: 11:30 - 12:30

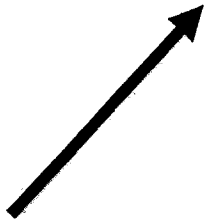
Please keep talking down

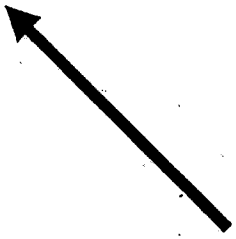
Interactive Question

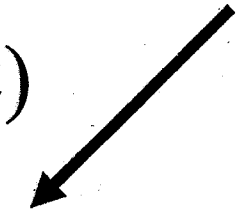
B

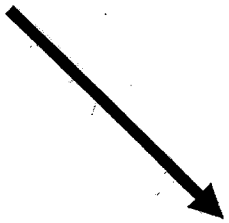
A rock is twirled on a string at a constant speed in a clockwise direction as shown. The direction of its acceleration at point P is



A) 

B) 

C) 

D) 

E) 

Interactive Question

(A)

You are riding on a merry-go-round. While sitting on a horse, the merry-go-round slows down so that it is rotating one-half as fast. By what factor does your centripetal acceleration change?

A) It is one-fourth as much
B) It is one-half as much
C) It is the same
D) It is twice as much
E) It is four times as much

Problem: In an Olympic bobsled race, the sled is traveling at a speed of 35 m/s when it moves through a banked curve. The bobsledders feel a centripetal acceleration of 2.2 "g's." What is the radius of the curve?

Given $v = 35\ m/s$

$a_c = 2.2\ g's$ $\quad 2.2(9.8\ m/s^2) = 21.6\ m/s^2$ want r

$$a_c = \frac{v^2}{r} \qquad r a_c = v^2 \qquad r = \frac{v^2}{a_c}$$

$$r = \frac{(35\ m/s)^2}{21.6\ m/s^2} = 56.7\ m$$

Interactive Question

(A)

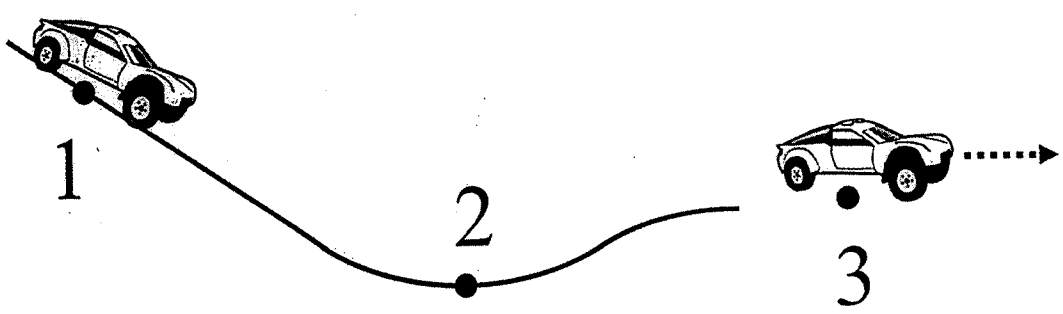
A 1500 kg car travels at a constant speed of 22 m/s around a circular track which has a radius of 80 m. Which statement is true concerning this car?

A) The velocity of the car is changing.
B) The car is characterized by constant velocity.
C) The car is characterized by constant acceleration.
D) The car has a velocity vector that points along the radius of the circle.
E) More than one of the above is true.

Interactive Question

E

A toy car rolls down a track and flies off the end. What direction is the instantaneous acceleration at points 1, 2 and 3?

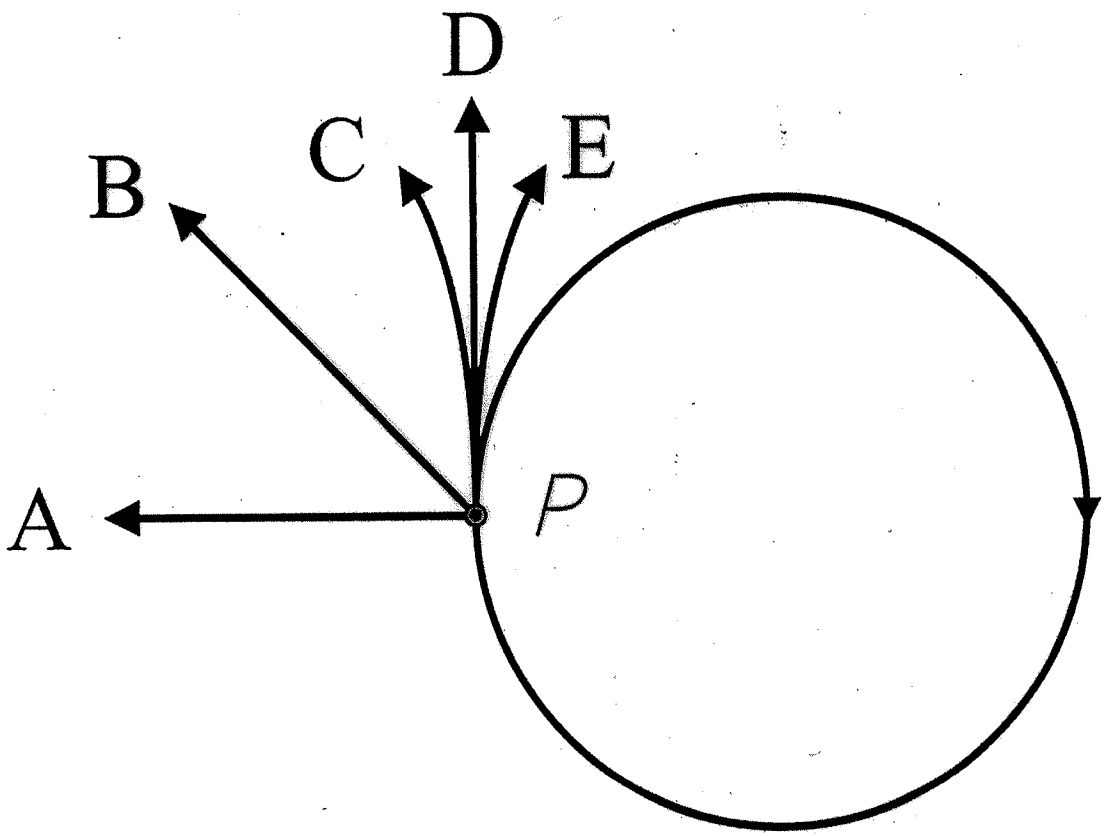


	(1)	(2)	(3)
A)	↓	←	→
B)	↓	←	↓
C)	↓	↑	→
D)	↘	←	↓
E)	↘	↑	↓

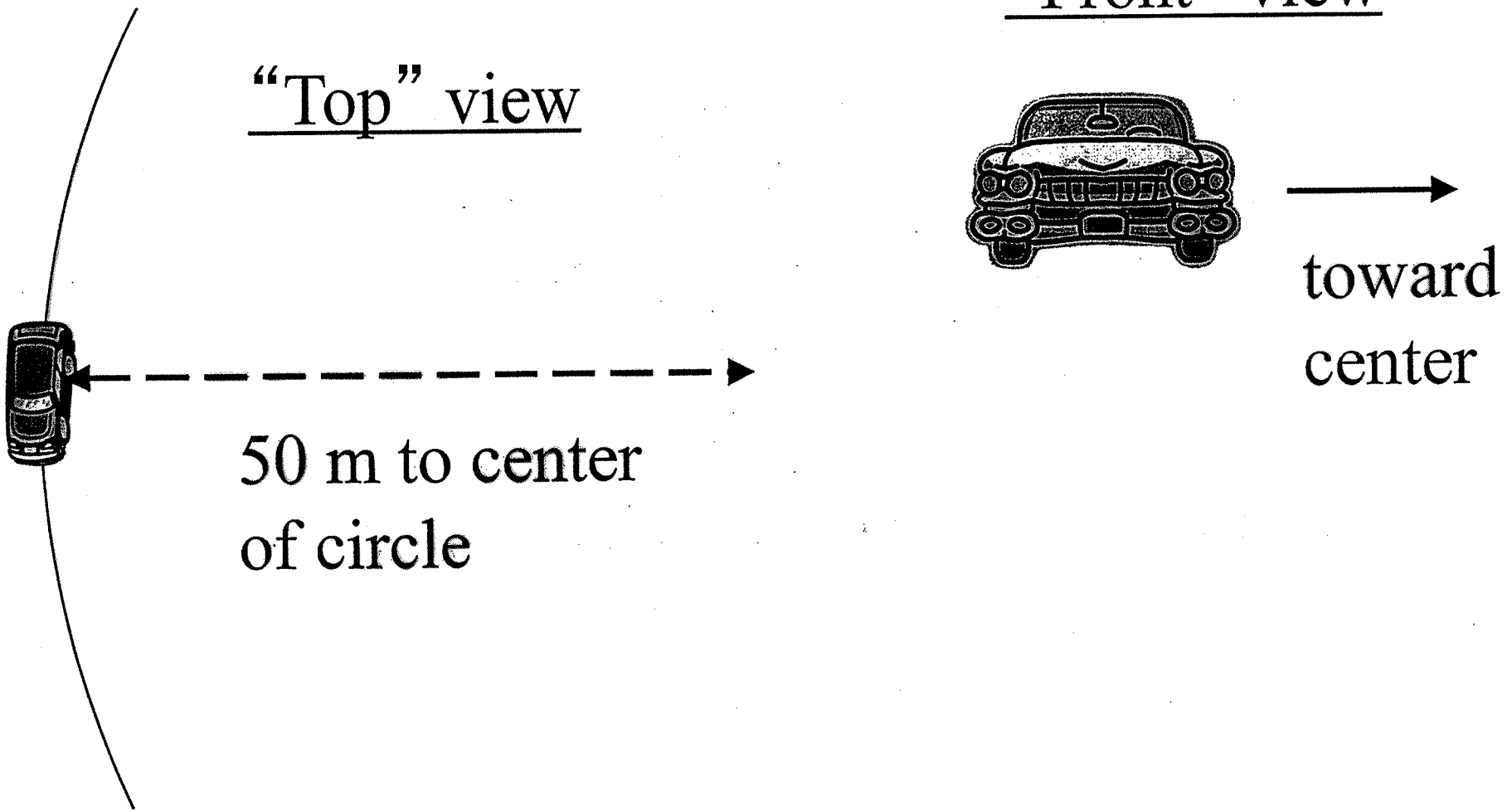
Interactive Question

D

A boy attaches a rock to a string which he then swings clockwise in a horizontal circle. The string breaks at point *P* on the sketch which shows a view from above. What path will the rock follow?



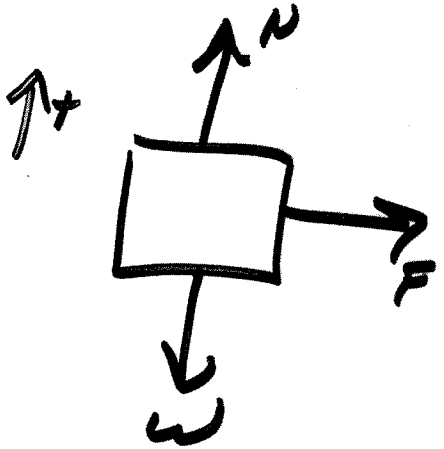
Problem: A 1900 kg car turns a corner on a flat road of radius 50.0 m. If the maximum force the road can exert on the tires is 12,000 N, what is the maximum speed the car can negotiate the turn without sliding?



Given $F = 12000\,N$ want V

$r = 50\,m$

$m = 1900\,kg$



$$N - w = 0$$

$$F = ma_c = \frac{mV^2}{r} = F$$

$$V^2 = \frac{rF}{m}$$

$$V = \sqrt{\frac{(50m)(12000\,N)}{1900\,kg}} = \boxed{17.8\,m/s}$$