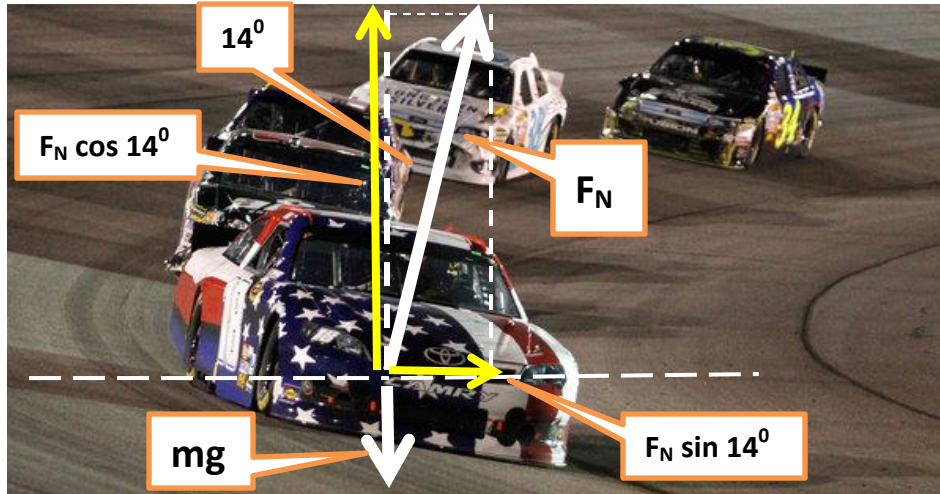


# CENTRIPETAL FORCE

Unit 14 Dr John P. Cise, Professor of Physics, Austin

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Please send Dr Cise an e-mail on how you used this physics application.

## Kurt, the Mellow Busch, Shows His Fire



Kurt Busch, in the No. 22 car, bristled at Jimmie Johnson after Saturday's race at Richmond, where the drivers traded contact.

**INTRODUCTION:** Richmond racetrack is a 0.75 mi oval(3960 ft) with 288 ft(R) radius on the turns . The track is banked at  $14^\circ$  on the turns. The centripetal force available from the banked turn is  $F_N \sin 14^\circ$ . Thus,  $F_N \sin 14^\circ = mV^2/R$ . These cars do not accelerate up or down thus,  $F_N \cos 14^\circ = mg$

**QUESTIONS:** (a) Show on banked turns  $\tan 14^\circ = V^2/Rg$  ?  
(b) Find the maximum speed these cars can go around these turns with just  $F_N \sin 14^\circ$  providing the needed centripetal force?  
(c)What provides the additional centripetal force if these cars exceed the velocity found in (b)?

**ANSWERS:** (a) You show where  $\tan 14^\circ = V^2/Rg$  comes from.  
(b) ~ 48 ft/s or 32.7 mph  
(c) \_\_\_\_\_.

RICHMOND, Va. (AP) — There has been a lot of discussion this season about Kyle Busch and whether he has finally matured enough to win his first Sprint Cup championship. Perhaps such scrutiny should instead be directed toward his older brother, Kurt. The Busch brothers advanced Saturday night into the 10-race Chase for the Sprint Cup championship. Kyle Busch will begin the series Sunday at Chicago ranked first in the Chase standings and tied with his rival Kevin Harvick for the points lead. Kurt Busch, meanwhile, starts the Chase ranked seventh in the standings and 9 points behind his younger brother. But the prospect of his winning a second title seemed slim after yet another run-in with Jimmie Johnson showed that Busch struggles to control his anger — especially when it comes to Johnson, the five-time defending champion.