CENTRIPETAL FORCE MULTIPLE CHOICE QUESTIONS
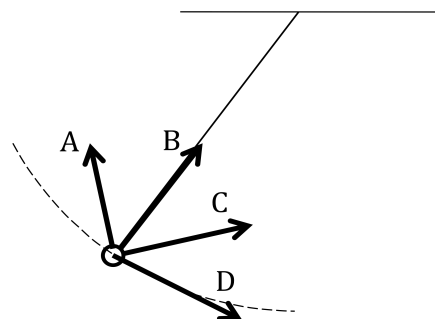
1.) A car rounds a curve while maintaining a constant speed.
    a.) The question could as well have been stated, "A car rounds a curve while maintaining a constant velocity."
    b.) With constant speed, the net force on the car is zero.
    c.) With constant speed, there is still be a net force that is directed outward (relative to the curve) on the car.
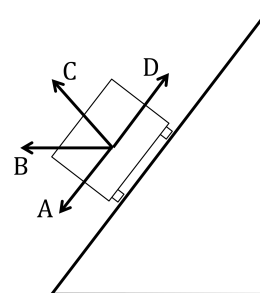   d.) With constant speed, there is still be a net force that is directed inward (relative to the curve) on the car.

2.) A mass attached to a string that is itself attached to the ceiling swings back and forth.
    a.) At the bottom of the arc, it has no net force acting on it.
    b.) At the bottom of the arc, it has no net force acting in the vertical.
    c.) At the bottom of the arc, tension and gravity balance one another out.
    d.) At the bottom of the arc, there is no centrifugal force.

3.) A mass attached to a string that is itself attached to the ceiling swings back and forth. If the bob is observed to be moving upward at a given instance, as shown to the right, which arrow best depicts the direction of the *net force* acting on the bob at that instant?
    a.) A
    b.) B
    c.) C
    d.) D

4.) For the bob shown in *Problem 3*:
    a.) The forces acting on the bob are tension, gravity and a centripetal force;
    b.) The center-seeking forces acting on the bob are tension and a centripetal force.
    c.) The only center-seeking force acting on the bob is tension.
    d.) If the bob had been moving downward, the net center seeking force would be the same as when the bob was moving upward along its arc.

5.) A car rounds a very steep, banked curve moving at low speed. A front-end view of the car is shown to the right. Which of the directions shown depicts the net centripetal force acting on the car.
    a.) A
    b.) B
    c.) C
    d.) D

6.) For the situation depicted in *Problem 5*, which direction depicts the net force acting on the car?
    a.) A
    b.) B
    c.) C
    d.) D

7.) For the situation depicted in *Problem 5*:
    a.) The net centripetal force is generated by friction.
    b.) The net centripetal force is generated by the normal and gravity.
    c.) The frictional force is static and its directed in the normal direction.
   d.) The frictional force is static and its directed up the incline.

8.) A car travels with constant speed around the track shown to the right. At which point will the centripetal force be the largest?
    a.) A
    b.) B
    c.) C
    d.) D
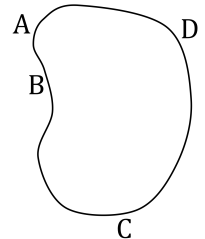
9.) A car travels counterclockwise with constant speed around the track shown to the right. Which of the vectors depicts the direction of the *net force* acting on the car at the point shown.
    a.) A
    b.) B
    c.) C
    d.) D
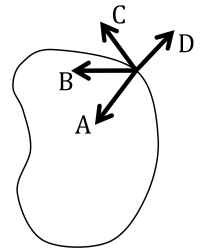
10.) The car traveling in *Problem 9* (see sketch) is observed to be speeding up. Which of the vectors depicts the direction of the *net force* acting on the car at the point shown.
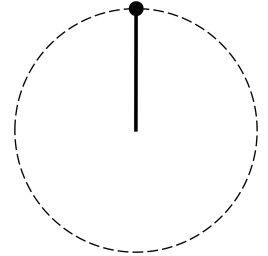   a.) A
    b.) B
    c.) C
    d.) D

11.) Which of the following statements is NOT true about centripetal forces:
    a.) They are always oriented along the line between the body and the center of the arc upon which the body moves.
    b.) They are always perpendicular to the velocity vector.
    c.) They are always perpendicular to the acceleration component that motivates the body to change its speed.
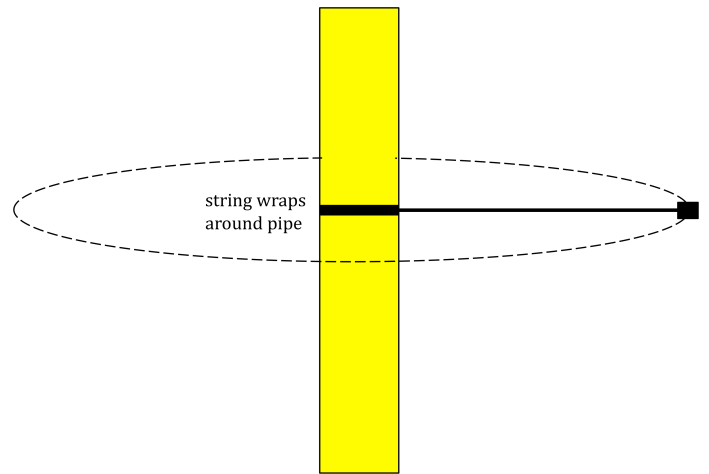   d.) They are one of the six naturally occurring forces used in conjunction with free body diagrams.

12.) A car of mass *m* travels around a curve with velocity v. What do you know about the centripetal force if the velocity triples?
    a.) Nothing as you don't know the radius of the arc.
    b.) The centripetal force increases by a factor of three.
    c.) The centripetal force increase by a factor of nine.
    d.) The centripetal force decreases by a factor of three.

13.) A string with a bob attached swings in the vertical (see sketch). If it just barely makes it through the top of its arc, you know that:
    a.) The velocity at the top will be zero.
    b.) The tension in the string at the top will be zero.
    c.) The centripetal force at the top will be zero.
    d.) The acceleration at the top will be zero.

14.) A string wraps around a fat pipe as a bob attached to the string is made to move in a circular path in the horizontal. Assuming the velocity is somehow held constant as the radius diminishes due to the wrapping, how will the centripetal force change?
    a.) It will stay the same.
    b.) It will diminish.
    c.) It will increase.
    d.) None of the above (this is a joke—it's got to be one of the three above).

string wraps around pipe

15.) A car going around a curve is found to be able to take the curve with maximum speed "v." You would like to double the maximum speed the car can take the curve. To do this, you could:
    a.) double the coefficient of friction between the car and the road;
    b.) quadruple the coefficient of friction between the car and the road;
    c.) halve the radius of the road;
    d.) double the radius of the road.

Solutions: D, D, C, D, B, B, D, A, A, B, D, C, B, C, B