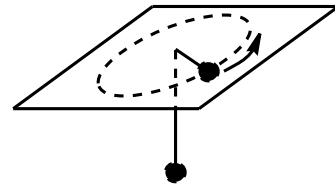


- The lifetime of a high speed elementary particle relative to a stationary observer appears to a stationary observer to be
 - Shorter than the particle's lifetime at rest;
 - The same as the particle's lifetime at rest;
 - Longer than the particle's lifetime at rest;
 - Any of the above depending on whether the particle is approaching or receding from the stationary observer.
- Two rockets pass each other at high speed. After each captain records that one year has passed he turns the space ships around and comes back at the same relative speed to meet the other spaceship. When the captains discuss their journey they
 - agree that they both turned around at the same time and that it was two years ago that they first passed each other;
 - They each think that the journey took more than two years for the other captain;
 - They each think that the journey took less than two years for the other captain.
 - disagree about who turned around first, but agree that it was two years ago that they first passed each other.
- An object with mass can never reach the speed of light because
 - Einstein said it couldn't and he was pretty clever.
 - it would take an infinite amount of energy to do so
 - if it did it would decay as all its mass would be converted to energy.
 - It actually can, but you can't detect it if it does because its length is contracted to zero.
- If the radius of the path of a body in uniform circular motion is doubled and the speed is kept the same the force needed must be
 - half as great as before.
 - the same as before.
 - twice as large as before.
 - four times the size as before.
- The angular velocity of the minute hand of a clock is
 - $\frac{1}{30}\pi$ rad/s. (b) $\frac{1}{1800}\pi$ rad/s. (c) 2π rad/min. (d) 60 rad/min.
- A heavy ball of mass 1.00 kg is whirled at a constant speed of 2.00 ms^{-1} on the end of a string in a horizontal circle of radius 1.50 m. The work done by the tension in the string during exactly one revolution is
 - 0 J (b) 2.67 J (c) 8.01 J (d) 25.1 J.

7. A 3.0 kg stone at the end of a 0.50 m long string is whirled in a vertical circle with constant velocity. If the tension in the string is 10 N at the top of the circle the tension at the bottom must be
- (a) 10 N (b) 30 N (c) 40 N (d) 70 N
8. A body which is traveling around a circle at constant speed
- (a) is not accelerated.
(b) has constant acceleration.
(c) is accelerated in the direction of motion.
(d) none of the above.
9. On a rainy day the coefficient of friction between the tires of a car and a level road surface is reduced to half its usual value. The maximum safe velocity for rounding a curve is
- (a) reduced to 71% of its original value.
(b) reduced to 50% of its original value.
(c) reduced to 25% of its original value.
(d) unchanged.
10. A puck of mass m is moving in a horizontal circle with uniform speed on a frictionless table. The puck is attached to a string which passes through a hole in the centre of the table. On the other end of the string is attached a bob with the same mass m . If more string lies below the hole than above it than the acceleration of the moving puck is



- (a) 0
(b) g
(c) greater than g
(d) less than g but not zero.