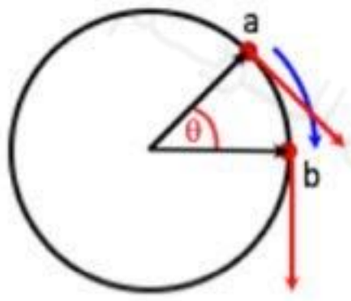
View hints View feedback

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QUESTION 1

Label the following circular motion vector diagram to show the different velocity vectors.





v1 ✓

acceleration vector Δ *a*

radial vector, *r*

displacement vector, Δ *r*

v2 ✓

QUESTION 2

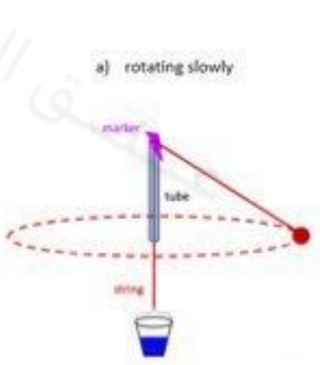
Label the forces acting on this ball as it rotates slowly.

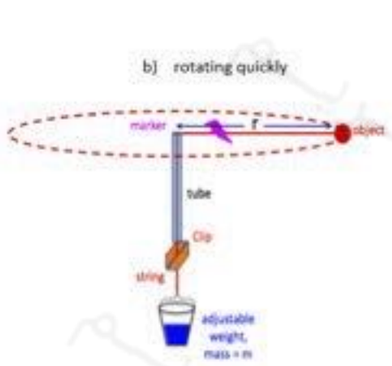
normal force | velocity vector | mass | position

centripet force

QUESTION 3

Select the sentence that correclty describes the forces in each of these two situations based on the spring position as the ball is moving in a uniform circular motion.





gr

centripetal force is smaller than *mg* ✓

no force of gravity, only centripetal force acts here

centripetal force = 0, only *mg* is acting on the ball

centripetal force is equal to *mg*

Newton's first law is applied here

QUESTION 4

Acceleration of a rotating object directed inward towards the center of rotation is called centripetal ✓ acceleration.

QUESTION 5

Label the terms you have learned about circular motion onto this picture of a wind turbine.



displacement vector | circular blade | position vector

QUESTION 6

What is centripetal acceleration?

- Acceleration of an object as it moves off the circular path along the tangent.
- Acceleration of an object moving in a circular motion due to gravity.
- ✓ Acceleration of a rotating object directed inward towards the center of rotation.
- Acceleration of a rotating object as it moves faster in a circular path.

QUESTION 7

A small rubber ball is attached to a string 40 cm long. The ball experiences a 19.4 m/s^2 net acceleration when it describes a uniform circular motion in which the centripetal force acting on the ball is 8.5 N. Calculate the ball's mass.

- 0.85 kg

- [x] 0.44 kg
- [ ] 1.65 kg
- [ ] 2.31 kg

QUESTION 8

A 200 g small ball is attached to a string that is 1.5 m long. It is spun so that it completes two full rotations every second accelerating at 237 m/s^2. What is the centripetal force acting on the ball?

- [ ] 47.4 kN
- [ ] 241 N
- [x] 47.4 N
- [ ] 74.7 N

QUESTION 9

A 1100 kg car is driving around a horizontal circular track, 50 m diameter, at a constant speed of 100 km/hr. What acceleration does the car experience if the net force acting on it is 30.9 kN?

- [x] 28 m/s^2
- [ ] no acceleration as the car is moving at a constant speed.
- [ ] 16 m/s^2
- [ ] 0.028 m/s^2

QUESTION 10

An object moving in a circle at constant speed experiences acceleration ✓ because it is changing direction ✓.

QUESTION 11

Is a ball moving in circular motion with a constant speed, experiencing acceleration?

- ○ No, because the ball is moving with a constant speed.
- ○ No, because the velocity is zero.
- ○ No, because the ball has no forces acting on it.
- ✓ Yes, because the velocity vector is changing as the ball rotates.

QUESTION 12

What causes centripetal acceleration?

- ○ The object is attached to a string.
- ○ The tangentially oriented velocity vector.
- ○ The object wanting to fly off in a tangent direction.
- ✓ The inward-directed force.

QUESTION 13

Select the characteristics of a uniform circular motion.

- ✓ constant period of rotation
- ✓ constant speed

- [x] non-zero acceleration
- [x] centripetal acceleration
- [ ] zero-resultant force
- [ ] constant velocity