Rotational Kinematics:

1. A disc rotates at a constant 1.40rad/s.

A. What is the angular displacement of a point 20.0cm from the centre of the disc in 4.00s?

B. What is the angular displacement of a point 30.0cm from the centre of the disc in 4.00s?

C. What is the distance travelled by a point 20.0cm from the centre of the disc in 4.00s?

D. What is the distance travelled by a point 30.0cm from the centre of the disc in 4.00s?

E. What is the tangential velocity of a point 20.0cm from the centre of the disc?

F. What is the tangential velocity of a point 30.0cm from the centre of the disc?

G. What is the tangential acceleration of a point 20.0cm from the centre of the disc?

H. What is the tangential acceleration of a point 30.0cm from the centre of the disc?

I. What is the radial (centripetal) acceleration of a point 20.0cm from the centre of the disc?

J. What is the radial (centripetal) acceleration of a point 30.0cm from the centre of the disc?

K. What is the **displacement** of a point 20.0cm from the centre of the disc after 4.00s?

L. What is the **displacement** of a point 30.0 cm from the centre of the disc after 4.00s?

2. A disc is originally at rest. The disc then speeds up to 45RPM in 1.20s.

A. What is the angular displacement?

B. What is the angular acceleration?

C. What is the tangential acceleration of a point 12.0cm from the centre of the disc?

D. What is the radial acceleration of a point 12.0cm from the centre of the disc at t=1.20s?

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3. A rigid rod has a 1.40kg mas affixed to its end. The rod is 2.0m in length and is fixed in place at the end opposite from the mass. The mass has an initial speed of 1.0m/s. The rod has an angular acceleration of 0.250rad/s2. How much time is required for it to make 5.0 complete rotations?

4. A bicycle has wheels with a radius of 35.0cm. As the bicycle rolls forward at 9.0m/s find:

A. The angular velocity of the wheel.

B. The tangential velocity of a point at the outer edge of the wheel relative to the axle.

C. The tangential velocity of a point at the top of the wheel relative to the ground.

D. The tangential velocity of a point at the bottom of the wheel relative to the ground.

E. The tangential velocity of a point at the front of the wheel relative to the ground.

F. The tangential velocity of a point at the rear of the wheel relative to the ground.

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