PHY1235: Physics for Engineers

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Helpful readings for this homework: Lecture #1; Chapter 9, section 9.1-9.2 of University Physics

Instruction

The objective for this problem set is to get a good grasp of the kinematics of rotational motion. For each problem you are provided with the expected answers. Your task is to provide a clear solution for each problem.

Write your solution on any paper and submit your answers in digital format using the link provided on this site https://phys1235.github.io/lecture-notes/. If your class in PHYS 1235 is Tuesday and Thursday choice the link in TTh column. If your class in PHYS 1235 is Monday and Wednesday choice the appropriate link in the MW column.

Problem Set #1: Kinematics of Rotational Motion

Problem 1:

The spin-drier of a washing machine revolving at 900 rpm slows down uniformly to 300 rpm while making 50 revolutions. Find (a) the angular acceleration and (b) the time required to turn through these 50 revolutions.

Problem 2:

A wheel of 40-cm radius rotates on a stationary axle. It is uniformly speeded up from rest to a speed of 900 rpm in a time of 20 s. Find (a) the constant angular acceleration of the wheel and (b) the tangential acceleration of a point on its rim.

Problem 3:

A car has wheels of radius 30 cm. It starts from rest and accelerates uniformly to a speed of 15 m/s in a time of 8.0 s. Find the (a) angular acceleration of its wheels and (b) the number of rotations one wheel makes in this time.

Expected Answers

Problem 1:

a) -4.0π rad/s^2

b) 5.0 s

Problem 2:

a) 4.7 rad/s^2

b) 1.9 m/s^2

Problem 3:

a) 6.2 rad/s^2

b) 32 rev