Sarah Lawrence College

First LaTeX Assignment

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1 Two Rad Cars

$$\omega = \frac{2\pi}{T}$$

$$c_{r40} = 2\pi(40) \approx 251.327$$

$$v = \frac{d}{T}$$

$$T = \frac{d}{v}$$

$$T = \frac{251.327}{50} \approx 5.0265s$$

$$\omega = \frac{2\pi}{5.0265} \approx 1.25$$

The omega is for the first car and for the second car at the start.

$$\omega = \frac{2\pi}{T}$$

$$c_{r42} = 2\pi(42) \approx 263.8938$$

$$v = \frac{d}{T}$$

$$T = \frac{d}{v}$$

$$T = \frac{263.8938}{50} \approx 5.27787s$$

$$\omega = \frac{2\pi}{5.27787} \approx 1.19$$

The omega is for the second car after moving out 2m.

$$\omega = \omega_0 + \alpha t$$

$$1.25 = 1.19 + \frac{\theta}{t^{\cancel{2}}}\cancel{t}$$

$$1.25 = 1.19 + \frac{\theta}{t}$$

$$.06 = \frac{\theta}{t}$$

$$t = \frac{\theta}{.06}$$

theta is the angular displacement

$w_1 = 1.25$ $w_2 = 1.25$
$v_1 = 50m/s$ $v_2 = ?$
$r_1 = 40$ $r_2 = 42$

The second car must move out 2 meters and then reach a speed of 60m/s to pass the first car. When it is ahead of the first car, it must move 2 meters in and it will then decelerate back to 50m/s.

Both cars start at a constant velocity. The second car must then increase its velocity when it moves out two meters to keep its angular velocity constant so it can keep up with the first car. The second car then increases its velocity and its omega to move ahead of the first car. The second car moves back in two meters after passing the first car and, since it is unable to maintain the higher velocity, decelerates back to its initial velocity. The angular velocity, tangential velocity, and radial velocity increase and decrease as the car's velocity increases and decreases.