Angular Quantities 8.0 - Videos for Chapter 8: <u>A, B and C</u> (The videos there will walk you through these)

Angle Conversions:

1 rotation = 1 revolution = 2π radians = 360 degrees

1. A grinding wheel goes through 2.70 rotations. What angle in radians is this? (17.0 rad)

2. A tire goes through 163 radians. What is that angle in rotations? (25.9 rot)

3. A diver's body rotates through 510. degrees. What is that in radians? (8.90 rad)

4. A wheel rotates through 45.0 radians. What is that in degrees? (2580 degrees)

5. A drill goes through 140. rotations starting up. How many radians is this? (880. rad)

Angular Velocity Conversions:

6. Convert 12.0 rot/s to rad/s. (75.4 rad/s)

7. Convert 62.8 rad/s to rot/s. (9.99 rot/s)

8. Convert 78.0 RPM to rad/s. (8.17 rad/s)

9. Convert 31.4 rad/s to RPM. (300. RPM)

10. Convert 34.0 rot/s to RPM. (2040 RPM)

11. Convert 670. RPM to rot/s. (11.2 rot/s)

12. Convert 45.0 RPM to rad/s. (4.71 rad/s)

13. Convert 15.0 Rot/s to rad/s. (94.2 rad/s)

Tangential Relationships: $s = \theta r$, $v = \omega r$, $a = \alpha r$

14. A 13.0 cm radius grinding wheel goes through 1400. radians. What distance does its edge travel in this time? (182 m)

15. A 45.0 cm diameter car tire rolls 56.0 m. Through what angle in radians does it go? (249 rad)

16. A 12.0 cm radius wheel is rotating at 19.0 rad/s. What is the lineal speed at its edge? (2.28 m/s)

17. A 78.0 cm diameter bike wheel is rolling at 15.0 m/s What is its angular velocity in rad/s? (38.5 rad/s)

18. A drill accelerates at 15.0 rad/s/s. What is the linear acceleration 0.024 m from the center of rotation? (0.36 m/s/s)

19. A skateboard with 60. mm (diameter) wheels accelerates at 2.30 m/s/s. What is the angular acceleration? (76.7 rad/s/s)

Tangential Relationships with Conversions:

20. A skateboard with 55 mm (diameter) wheels goes through 13.0 rotations, what distance does it travel? (2.25 m)

21. A 45.0 cm radius wheel rolls through 310. degrees. What distance does it travel? (2.43 m)

22. What is the linear speed (in m/s) at the edge of a 13.0 cm radius grinding wheel spinning at 1200. RPM? (16.3 m/s)

23. A 1.80 m radius merry go round spins at 1.40 rot/s. What is the speed at its edge? (15.8 m/s)