Equation Worksheet

Name: _____ Number: ____ Date: _____ Per: _____

For each equation, on the first line rewrite the equation in words. On the second line rewrite the equation using the appropriate SI units.

Example: $F = ma$

force = mass × acceleration

$N = kg \times m/s^2$

1. $v = \Delta x/\Delta t$

_____

_____

2. $a = \Delta v/\Delta t$

_____

_____

3. $v_f = v_i + a\Delta t$

_____

_____

4. $\Delta x = v_i\Delta t + \frac{1}{2}a\Delta t^2$

_____

_____

5. $v_f^2 = v_i^2 + 2a\Delta x$

_____

_____

Complete the bridge equations to convert between linear motion and the appropriate rotational analogue.

Example: $s = r\theta$

6. $v =$ _____

7. $a =$ _____

Complete the rotational analogues to the kinematic equations from the previous page.

Example: $\omega = \Delta\theta/\Delta t$

angular velocity = change in angle / change in time

rad/s = rad / s

8. $\alpha =$ _____

9. $\omega_f =$ _____

10. $\Delta\theta =$ _____

11. $\omega_f^2 =$ _____

For each equation, on the first line rewrite the equation in words. **Be specific. If, for example, the equation is for force gravity, write "force gravity," not just "force."** On the second line rewrite the equation using the appropriate SI units.

12. $F_c = mv^2/r$

13. $F_c = m\omega^2 r$

14. $a_c = v^2/r$

15. $F_f = \mu F_N$

16. $p = mv$

17. $KE = \frac{1}{2}mv^2$

18. $U_g = mgh$

19. $I = \sum mr^2$

20. $\tau = rF\sin\theta$

21. $\tau = I\alpha$

22. $KE_{rot} = \frac{1}{2}I\omega^2$

23. $L = mvr$

24. $L = I\omega$

25. $F_g = mg$

26. $F_g = Gm_1m_2/r^2$

27. $g = GM_E/R_E^2$

28. $U_g = Gm_1m_2/r$

29. $v_e = \sqrt{(2GM/R)}$

30. $v = 2\pi r/T$

Fill in the blank with the appropriate coefficient in the moment of inertia equations for each given body.

31. Hoop/ hollow cylinder : I = _____ MR^2

32. Disk/ solid cylinder: I = _____ MR^2

33. Hollow sphere: I = _____ MR^2

34. Solid sphere: I = _____ MR^2

35. Thin rod/ door, axis thru center: I = _____ ML^2

36. This rod/ door, axis thru end: I = _____ ML^2