



**PENNSYLVANIA CENTRAL REGIONAL SCIENCE OLYMPIAD 2007
PHYSICS LAB C DIVISION**

Answer KEY

SECTION 1

/3 1. 1.22 m/s²

/3 2. 0.858 N

/3 3. 0.159 N m

/3 4. 6.58 rad/s²

/3 5. 0.0241 kg m²

/3 6. 1.41 kg

/3 7. 32.9 rad/s

/3 8. 13.1 rotations

/3 9. 13.1 J

/3 10. 87.6%

**BONUS
GYROSCOPE**

SECTION 2

/3 1. IMA = 4

/3 2. 40 cm

/3 3. AMA = 3.64

/3 4. 40 cm

/3 5. 2.00 rad/s² CCW

/3 6. 0.600 rad/s² CW

/3 7. 12.0 rad/s CCW

/3 8. 10.8 rad CW

/3 9. 3.00 m/s

/3 10. 286 rpm CW

SECTION 3

/3 1. 1.82 m/s²

/3 2. 24.2 rad/s²

/3 3. 4.26 m/s

/3 4. 56.8 rad/s

/3 5. 9.09 J

/3 6. 6.06 J

/3 7. 0.00375 kg m²

/3 8. hollow sphere

/3 9. 0.0909 N m

/3 10. 1.21 N

SECTION 4

/3 1. 2.19E6 s

/3 2. 2.86E-6 rad/s

/3 3. 3.86E47 kg m²

/3 4. 1.11E42 kg m²/s

/3 5. 1.58E36 J

/3 6. 2.69E43 kg m²

/3 7. 4.11E-2 rad/s

/3 8. 1.53E2 s

/3 9. 2.27E40 J

/3 10. The redistribution of mass converts gravitational potential energy into rotational kinetic energy.

SCHOOL CODE

SCHOOL NAME

PARTICIPANTS