

# Exam Review

ChaoYang Cheng

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## 1 Prepare for final exam

Orbits, momentum, electricity, heat

Newton second law:  $F = ma$

$$F(g) = \frac{mMG}{r^2}$$

$$KE = \frac{mMG}{2r}$$

$$PE = mgh$$

$$PE+KE=0$$

$$E = \frac{PE}{2} = -KE$$

$$V_{escape} = \sqrt{\frac{2MG}{r}}$$

$$Density = \frac{charge}{volume}$$

$F=qE$ (Force on electron)

$$w = \frac{\Delta\theta}{\Delta t}$$

$$V=wr$$

$$PE=qV$$

$$I = \frac{\Delta q}{\Delta t}$$

$$Ampere = \frac{Coulomb}{sec}$$

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$R_{total} = R_1 + R_2$$

$$Power = \frac{\Delta Energy}{\Delta Time}$$

$$P=IV$$

$$F_b = qvB \times \sin\theta$$

Heat cycle:  $W = P \times \Delta V$

1. Isobaric Expansion - constant pressure and increasing volume (add heat)
2. Isovolumetric cooling - decreasing pressure and constant volume (release heat)
3. Isobaric compression - constant pressure and decreasing volume (release heat)
4. Isovolumetric heating - increasing pressure and constant volume (add heat)