# College Physics

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This course may be taken for 4 semester hours of college credit from OCC for a cost of $180.00 or may be taken for Regents credit at no cost. Either choice will provide you with the same curriculum and experiences. *ALL students will take the Regents exam in January (having met the lab requirement).*

Class website: **www.hannibalcsd.org/teacherwebs/cburch**

On my website you will find:
your weekly homework planner, daily class notes, links to online textbook resources and other physics related websites

Aug 31-6:30 AM

## What you can expect in this class:

- Nearly daily practice with your physics concepts (HW)
- Hands-on experiences to develop understanding
- The expectation that you will be mature and self-disciplined, demonstrated by completed assignments and readings
- Regular assessment of your understanding: Quiz, test, graded random HW, lab reports, projects, whiteboarding reports
- Daily use of a scientific or graphing calculator to complete applied math problems assigned in class or for HW

Aug 31-6:41 AM

## What you can expect from your teacher:

- Additional tutoring afterschool or during free periods when requested by students
- Feedback regarding your progress in class
- Respect, patience, "the benefit of the doubt", & concern
- Coaching!
- Many opportunities to demonstrate your understanding of physics
- The consistent expectation of college level work and habits of mind.
- AND that mistakes will be made regularly- be on the look-out

Aug 31-6:50 AM

Solve the following equation for the value a

$$\frac{5}{a+2} = \frac{3}{a-2}$$

$$3(a+2) = 5(a-2)$$

$$3a+6 = 5a-10$$

$$10 - 3a + 3a + 6 = 5a - 10 - 3a + 10$$

$$10 + 6 = 5a - 3a$$

$$16 = 2a$$

$$8 = a$$

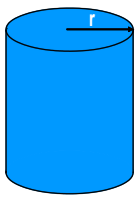
Aug 31-6:59 AM

Solve the following equation for the value of x

$$\frac{4x-35}{3} = 9(1-x)$$

Aug 31-7:01 AM

Determine the radius r of a cylindrical tank whose cross-sectional area is 5.00 $m^2$




Aug 31-7:08 AM

Orders of magnitude (powers of 10)

$10^0$ =

$10^3$ =

$10^6$ =

$10^{-3}$ =

$10^{-6}$ =

$10^{-9}$ =

$10^1$ =

$10^9$ =

Aug 31-7:14 AM

Scientific notation with your calculator...

$(6.67 \times 10^{-34})(9.81 \times 10^{-27}) = ?$

Type in 6.67 as you normally would then keystroke
[2nd] [EE] [change sign] 34 [times]
9.81 [2nd] [EE] [change sign] 27
[Enter]

DO NOT use the ^ sign for exponent powers

DO NOT use $10^x$ for powers of ten in your calculations

ONLY USE 2nd EE to enter scientific notation into calculations

Aug 31-7:31 AM

## Orders of magnitude

Determine the order of magnitude difference between the force of gravity between a proton and an electron separated by a distance of 1 mm (0.001m) and the electrostatic force between the two charges. Use the following relationships:

Gravitational Force

$$F_g = G\frac{m_1 m_2}{d^2}$$

G = gravitational constant
$m_1$ = mass of one particle
$m_2$ = mass of other particle
d = distance of separation

Electrostatic Force

$$F_e = k\frac{q_1 \cdot q_2}{d^2}$$

k = electrostatic constant
$q_1$ = charge of one particle
$q_2$ = charge of other particle
d = distance of separation

Aug 31-7:20 AM

## Orders of magnitude

Calculate using powers of ten only

Determine the order of magnitude difference between the force of gravity between a proton and an electron separated by a distance of 1 mm (0.001m) and the electrostatic force between the two charges. Use the following relationships:

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$$F_g = G\frac{m_1 m_2}{d^2}$$

G = gravitational constant
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Aug 31-9:53 AM

## Significant Figure Rules

Addition and subtraction:

Answers can only be significant to the least significant quantity's decimal place

4.523 cm + 1.0 cm = 5.5 cm
2.567 mm + 2 cm = 5 cm

Multiplication and division:

Answers are limited to the least number of significant figures in any quantity

$(4.25 \text{ cm})(1.0 \text{ cm}) = 4.3 \text{ cm}^2$
2 x 4.5 cm = 9 cm NOT 9.0 cm

Aug 31-9:33 AM

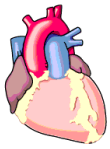
## Fermi Questions

Approximately how many regular marshmallows can fit into this classroom?

How long would it take a turtle to walk from our high school to KMS?
to Cato?

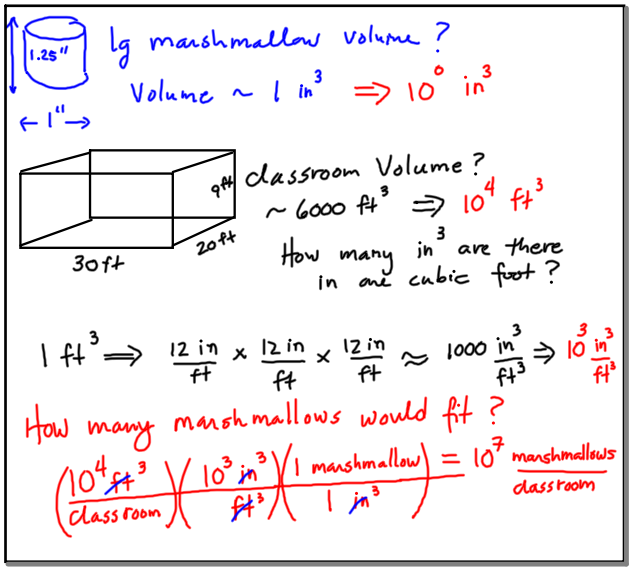
Aug 31-9:42 AM

Approximately how many times does a person's heart beat in their lifetime?



What is the order of magnitude of your answer?

Aug 31-9:47 AM




Aug 31-9:56 AM