

AP → BACK ROW
 - START ON ONLINE LESSON
 THEN ONLINE HW

IB → FRONT ROWS
 LECTURE: CHAPTER ONE
 UNITS, etc.

Sep 3-8:15 AM

(IB) CHAPTER 1
 NOT REALLY ABOUT PHYSICS
 - MATH, UNITS, METHODS

QUANTITY MASS
 LENGTH
 TIME
 ELECTRIC CHARGE

USE UNITS TO MEASURE
THESE QUANTITIES

(EX) MASS: GRAMS, ~~POUNDS~~, SLUG
 LENGTH: METER, INCHES, MILE
 LIGHT YEARS, PARSEC
 TIME: SECONDS, HOUR, DAY/
 DECADE ...
 E-CHARGE: COULOMB

Sep 3-8:40 AM

UNIT CONVERSIONS

THE POWER OF ONE

CONVERT YDS TO MILES

$$1760 \text{ YDS} = 1 \text{ MILE}$$

$$400 \text{ YD} = ? \text{ MILES}$$

1. FIND CONVERSION FACTOR ←
2. MAKE A FRACTION OUT OF IT THAT EQUALS ONE

$$\frac{1 \text{ MILE}}{1760 \text{ YDS}}, \quad \frac{1760 \text{ YDS}}{1 \text{ MILE}}$$

3. CHOOSE CORRECT FRACTION

$$400 \text{ YDS} \cdot \frac{1 \text{ MILE}}{1760 \text{ YDS}} = 0.23 \text{ MILES}$$

GET THE "OLD" UNITS TO CANCEL

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EXCONVERTING UNITS USING 2+ CONVERSIONS

$$1.9 \times 10^4 \text{ YDS} \rightarrow \text{MILES}$$

$$1 \text{ YD} = 3 \text{ ft}$$

$$1 \text{ MILE} = 5280 \text{ ft}$$

$$1.9 \times 10^4 \text{ YDS} \cdot \frac{3 \text{ ft}}{1 \text{ YD}} \cdot \frac{1 \text{ MILE}}{5280 \text{ ft}} = 10.8 \text{ MILES}$$

Sep 3-9:03 AM

DIMENSIONAL ANALYSIS

$a = 2xt$ (P) → ?

a: acceleration $\frac{L}{T^2}$, m/s²
 x: position L
 t: time T

$\frac{L}{T^2} = L \cdot T^P$

$\frac{1}{T^2} = T^P$

$T^{-2} = T^P$

$P = -2$

$a = 2xt^P$
 $a = 2xt^{-2}$
 $a = \frac{2x}{t^2}$

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PI.9 GIVEN: $T = 2\pi \sqrt{\frac{m}{k}}$

FIND: DIMENSIONS OF k

T: PERIOD (TIME)
 m: MASS
 k: ?

μ
micro
μm: micrometer
10⁻⁶ m

REWRITE EQ'N IN TERMS OF DIMENSIONS

$T = 2\pi \sqrt{\frac{m}{k}}$

$T = \sqrt{\frac{M}{k}}$

DO THE ALGEBRA (SOLVE FOR k)

$T^2 = \frac{M}{k}$

$T^2 k = M$

$k = \frac{M}{T^2}$

Sep 3-9:17 AM