

# GRE Physics Study Notes - Strategy / Tricky Notes

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## 1 Look at question before trying to answer the question

1. How far apart are they?  
Orders of magnitude, drop all but 1st significant fig  
very close  $\rightarrow$  need precise values
2. “Most nearly” means that my exact answer will not appear  
Can do some rounding, keep 1 or 2 significant figs
3. True vs Not True:  
Make sure you know which one  
Circle the words

## 2 Don’t just guess

Try to write an equation or equality before answering. Justify short answers.

## 3 Use a Section Classification Key

1. Circle #  $\rightarrow$  come back definitely
2. Cross  $\rightarrow$  done

## 4 Read the Whole Problem

Make sure I understand problem very quickly.

## 5 KNOW WHICH ONES TO SKIP

## 6 Be Aware Of

### 6.1 Units

kcal =  $10^3$  cal

Answers + given in problem

Will ask for answer in kJ, etc.

### 6.2 Frequency vs $\omega$

Hz always means frequency

rad/s =  $\omega$

$\omega = 2\pi\nu$ , units of  $\frac{2\pi\text{radians}}{\text{rev}}$

Revolutions always imply frequency

## 6.3 Signs and Directions

Especially in conservation of momentum problems,  $v$  vs  $-v$

Doppler Shift Problems:  $-v$  if moving towards you,  $+v$  if you move towards it

Sometimes they don't specify where  $\hat{z}$  is, so don't get hung up on RHR if they don't label it.

## 6.4 Answer doesn't fit answers

It might be given in another form. e.g.,

$$\frac{e^{-\epsilon/kT}}{1 + e^{-\epsilon/kt}} \rightarrow \frac{1}{e^{\epsilon/kT} + 1} \quad (1)$$

## 7 Problem Strategy

### 7.1 When in doubt about E&M fields

Write out maxwell's equations and look for how the field will be changed or how it'll look.

Write out Lorentz forces, how does the E & B move the particle

### 7.2 Graphs

Pick out key features

Axis + relations to other quantities

### 7.3 Square Roots and Fractions

Use bounding values

$x = \sqrt{.78}$  ,  $.8^2 = .64$  ,  $.9^2 = .81$ , so between 8 and 9.

### 7.4 Sneaky Famous Experiments

They hide them in other questions about similar equations

### 7.5 Numbers go in Last

Clearly write exponentials

Say # over to myself as I write

### 7.6 If the answer is an Equation

Think in limits and units

## 8 Common Errors

### 8.1 Angstrom

$\text{\AA} = 1 \times 10^{-10} \text{ m}$

## 8.2 Collision Problems

Conserve  $p$  for initial/final conditions - don't forget  $\pm v$ .  
Conserve  $KE$  for  $\Delta E$  between  $U$  &  $KE$  only!

## 8.3 Most Nearly

My answer will not be there, don't fret.

## 8.4 When Rounding

Keep track of up vs down so will know if final answer is less or more.

## 8.5 Fractions!

$$\frac{1}{2 \times 10^{-5}} = \frac{1}{2} \times 10^5 = .5 \times 10^5 = 5 \times 10^4 \quad (2)$$

## 9 Tricks

For relativity, write down equations first, then see if you can simply divide. Given  $E$  and  $p$ , find  $v$ :

$$\frac{E}{p} = \frac{\gamma mc^2}{\gamma mv} \rightarrow v \quad (3)$$