

01 Objectives, equations and vocabulary-Basic Skills & Problem Solving

$f = 1/T = \text{cyc/sec}$ $v = f \lambda$ $x = v t$ $2^{(1/12)} = 1.05946$ $A_0 = 27.5 \text{ Hz}$	$M = V_0/v_{\text{sound}}$ $v_{\text{sound}} = 331 + 0.6T(^{\circ}\text{C})$ $v_{\text{sound}} \sim 340 \text{ m/s}$ $e = 1.60 \times 10^{-19} \text{ C}$ $k = 9.0 \times 10^9 \text{ Nm}^2/\text{C}^2$ $Q = ne$	$V = W/q = \text{J/C}$ $i = \Delta Q/\Delta t$ $\Delta V = i R$ $P = E/t$ $P = iV$ $P = V^2/R$	$I \propto \text{inversely with } r^2$ $\Delta: +10 \text{ dB} = 2x \text{ Vol} = 10x I$ $\text{Beats} = f_1 - f_2 $ $\text{Series } R_e = R_1 + R_2$ $\text{Parallel } 1/R_e = 1/R_1 + 1/R_2$ $N_1/V_1 = N_2/V_2$	$F = k \frac{q_1 q_2}{r^2}$ $E = \frac{F}{q} = \frac{kq}{r^2}$
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Basic Skills

Students should understand the objectives below well enough to apply them to novel situations.

1. This student knows how to use the EE button
2. The student knows how to use a calculator to solve problems with scientific notation, trig functions and inverse trig functions.
3. The student can solve problems using t-charts, including practical problems.
4. The student can recognize standard SI units and has memorized common prefixes.
5. The student can convert between standard SI units and SI units with common prefixes.

Problem-solving skills

Students should understand the objectives below well enough to apply them to novel situations.

1. The student knows and can use the four step method.
2. The student can demonstrate consistent use of steps two and three in the four step problem-solving method, even for sets of variables and equations that he/she is not familiar with.
3. The student is skilled at solving inverse equations such as: $Y = A/X$ (solve for X).
4. The student can solve problems where something changes rather than computing the actual value. This includes linear equations, inverse equations, quadratics and especially the inverse square law.
5. The student understands the three ways to get information from a graph

New Vocabulary list

<ol style="list-style-type: none"> 1. EE button 2. Sin, Cos, Tan 3. Degrees 4. Radians 5. Inverse functions 6. T-charts 7. Factor label 8. Conversion factor 9. Diagonals 10. Base 11. Prefix 12. SI units 13. SI base units 14. Tera 15. Giga 	<ol style="list-style-type: none"> 16. Mega 17. Kilo 18. Centi 19. Milli 20. Micro 21. Nano 22. μ 23. Rounding 24. Scientific notation 25. 4-step method 26. Known 27. Unknown 28. Δ 29. Direct relationship 30. Inverse relationship 	<ol style="list-style-type: none"> 31. 	<ol style="list-style-type: none"> 32.
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