Week 18 Homework Assignments

Assigned February 6, 2014

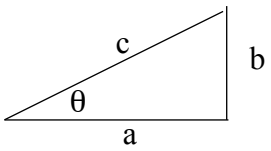
In this week's homework we will wrap up our unit on energy with some energy conservation practice and a quiz on Standard E2. This is followed by some review and practice involving the circuit concepts we developed through the in-class experiments, and completion of the 3rd part of the Motion Analysis Project. The final topic on the homework is circular motion, in which you will learn how to apply Newton's 2nd Law to objects moving with constant speed in a circle. This might seem to be a strange time to work on circular motion, but it is in preparation for our unit on magnetism, when we will need these skills. (Any ideas why?)

Topics	Assignments with time estimates
Energy conservation practice	☐ Reflection ☐ **Ch 5 Review #30, 33, 34a, 35, 37, 42, 49** (p.186,187) Be sure to draw LOL diagram for each problem that involves conservation of energy. The "O" should have system objects listed inside. (1 hr)
Quiz	☐ Quiz 14 - Closed book. You need pencil & calculator. Equations are provided. (Estimate 30 min/ Time Limit 1 hr) Standards: E2
Electricity Concepts and Practice	☐ "Electricity Reading 1" (20 min) ☐ **Section 1 Homework** (25 min) ☐ **Section 2 Homework** (25 min)
Motion Analysis Project	☐ Complete analysis and descriptions for Part 3 "Description of Momentum" (1 hr)
Circular Motion	☐ Watch the " Objects Moving with Constant Speed in a Circle" lesson videos: Part 1 (10 min), Part 2 (13 min), and Part 3 (7 min). An optional outline for the videos is posted if you want to print it for taking notes while watching the videos. ☐ "**Circular Motion Concepts**" (30 min)

- ☐ Arrange bold assignments in order and staple this sheet on top.
- ☐ Separately attach the Motion Analysis Project work
- ☐ Check off all the assignments above that you completed.

Math

$a^2 + b^2 = c^2$



$\sin\theta$ = opp/hyp
$\cos\theta$ = adj/hyp
$\tan\theta$ = opp/adj

Quadratic Formula

If $ax^2 + bx + c = 0$, then

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

Kinematics

$$s = \frac{D}{\Delta t} \qquad v = \frac{\Delta x}{\Delta t} \qquad a = \frac{\Delta v}{\Delta t}$$

$$\Delta x = v_i \Delta t + \frac{1}{2} a \Delta t^2$$

$$\Delta x = \frac{1}{2}(v_i + v_f)\Delta t$$

$$v_f = v_i + a\Delta t$$

$$v_f^2 = v_i^2 + 2a\Delta x$$

Newton's Laws

$F_{net} = ma$ ($\Sigma F = ma$)

$F_g = mg$
$F_{fsmax} = \mu_s F_N$
$F_{fk} = \mu_k F_N$

$Fg = G\frac{m_1 m_2}{r^2}$ ($G = 6.673 \times 10^{-11}$ Nm^2/kg^2)

Momentum

$p_i + \Delta p = p_f$
$F_{net}\Delta t = \Delta p$

Energy

$W = F^*\Delta x$

$E_i + \Delta E = E_f$
$E_{el} = (1/2)kx^2$ $E_k = (1/2)mv^2$
$E_g = mgy$ $E_{int} = F_f d$

$P = E_{transferred}/\Delta t$