

Midterm #1 Information
Physics 111-01, Spring 2016

The first midterm exam will happen during class on Friday, February 26th. It will be closed-note and closed-book, and you will have the entire class period to complete the test. There will be a mix of multiple-choice questions (10-15) and some worked problems (2-3). You will need to bring a pencil, a good eraser, a calculator, and an 882-E Scantron form. It is a good idea to bring extras just in case!

The exam will cover material from Chapters 1, 2, 3, and 5 of the Walker textbook. You should be familiar with kinematics, motion graphs, Newton's Laws problems, vectors, and of course units and sig figs. The following equations list will be provided at the exam. Be prepared to answer conceptual questions and to solve numerical problems.

PHYS 111 – Equations for Midterm #1
 Vector quantities are shown in **bold**.

Motion and Kinematics:

$\mathbf{v}_{\text{avg}} = \Delta \mathbf{x} / \Delta t$ (constant velocity)
 $\mathbf{a}_{\text{avg}} = \Delta \mathbf{v} / \Delta t$ (constant acceleration)

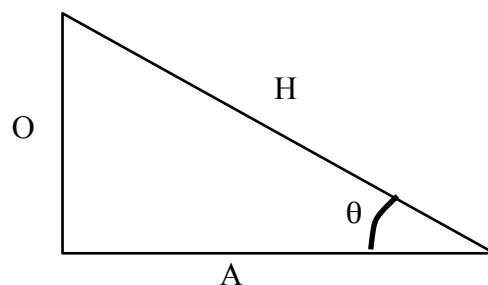
$x_f - x_i = v_i t + \frac{1}{2} a t^2$
 $v_f = v_i + a t$
 $v_f^2 = v_i^2 + 2a(x_f - x_i)$

Forces:

$\Sigma \mathbf{F} = \mathbf{F}_{\text{net}} = m \mathbf{a}$
 $\mathbf{F}_{21} = - \mathbf{F}_{12}$
 $\mathbf{w} = m \mathbf{g}$
 $F_{\text{fric}} = \mu F_{\text{norm}}$

Triangles:

$\sin \theta = O/H$
 $\cos \theta = A/H$
 $\tan \theta = O/A$
 $H^2 = O^2 + A^2$



QUANTITY	SYMBOL	UNIT OR VALUE
Mass	m	kg
Position	x	m
Displacement	x	m
Time	t	s
Velocity	v	m/s
Acceleration	a	m/s ²
Force	F	N
Acceleration of gravity	g	9.8 m/s ² or 9.8 N/kg
Coefficient of friction	μ	unitless

Conversion factors: 1 km = 10³ m
 1 m = 10² cm
 1 cm = 10¹ mm
 1 nm = 10⁻⁹ m