

MIDTERM EXAM #2 FORMULA SHEET

PHYS 211 SECTIONS 1 & 70
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The following are formulas that you might find useful on the exam. Some equations apply only when certain conditions hold, while others are always true. You will only need some of these equations for the exam.

(1)	$\bar{s} = \frac{d}{\Delta t} = \frac{d}{t_f - t_i}$
(2)	$\bar{v} = \frac{\Delta x}{\Delta t} = \frac{x_f - x_i}{t_f - t_i}$
(3)	$\bar{a} = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{t_f - t_i}$
(4)	$v = v_o + at$
(5)	$x = x_o + \frac{1}{2}(v + v_o)t$
(6)	$x = x_o + v_o t + \frac{1}{2}at^2$
(7)	$v^2 = v_o^2 + 2a(x - x_o)$
(8)	$v = v_o - gt$
(9)	$y = y_o + v_o t - \frac{1}{2}gt^2$
(10)	$y = y_o + \frac{1}{2}(v + v_o)t$
(11)	$v^2 = v_o^2 - 2g(y - y_o)$
(12)	$x = x_o + v_{xo}t + \frac{1}{2}a_x t^2$
(13)	$y = y_o + v_{yo}t + \frac{1}{2}a_y t^2$
(14)	$v_x = v_{xo} + a_x t$
(15)	$v_y = v_{yo} + a_y t$

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$$(16) \quad \vec{\mathbf{v}}_{AB} = -\vec{\mathbf{v}}_{BA}$$

$$(17) \quad \vec{\mathbf{v}}_{AB} = \vec{\mathbf{v}}_{AC} + \vec{\mathbf{v}}_{CB}$$

$$(18) \quad \vec{\mathbf{F}}_{\text{net}} = \sum \vec{\mathbf{F}}_i$$

$$(19) \quad \vec{\mathbf{a}} = \frac{1}{m} \vec{\mathbf{F}}$$

$$(20) \quad W = mg$$

$$(21) \quad F_x = ma_x$$

$$(22) \quad F_y = ma_y$$

$$(23) \quad f_s \leq \mu_s N$$

$$(24) \quad f_s^{\text{max}} = \mu_s N$$

$$(25) \quad f_k = \mu_k N$$

$$(26) \quad W = (F \cos \theta) d$$

$$(27) \quad F_s = -kx$$

$$(28) \quad W_s = \frac{1}{2} kx^2$$

$$(29) \quad K = \frac{1}{2} mv^2$$

$$(30) \quad W = K - K_0 = \Delta K$$

$$(31) \quad U = \frac{1}{2} kx^2$$

$$(32) \quad U = mgy$$

$$(33) \quad \sum E = \text{const}$$

$$(34) \quad \bar{P} = W/t$$

$$(35) \quad \epsilon = \frac{W_{\text{out}}}{E_{\text{in}}}$$

$$(36) \quad 1 = \sin^2 \theta + \cos^2 \theta$$

$$(37) \quad \sin 2\theta = 2 \sin \theta \cos \theta$$

$$(38) \quad \theta = \tan^{-1} \left| \frac{C_y}{C_x} \right|$$

$$(39) \quad C = \sqrt{C_x^2 + C_y^2}$$

$$(40) \quad 0 = ax^2 + bx + c$$

$$(41) \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$(42) \quad g = 9.80 \frac{\text{m}}{\text{s}^2}$$