Equations for Exam 1

Chapter 2

$$v_{\text{avg}} = \frac{\Delta x}{\Delta t} \qquad v = \frac{dx}{dt} \qquad a_{\text{avg}} = \frac{\Delta v}{\Delta t} \qquad a = \frac{dv}{dt}$$

Special Case:

$$v_f = v_i + at \qquad v_{\text{avg}} = \frac{1}{2}(v_i + v_f) \qquad x_f = x_i + v_{\text{avg}}t$$

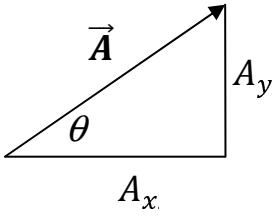
$$x_f = x_i + v_i t + \tfrac{1}{2}at^2 \qquad v_f^2 = v_i^2 + 2a(x_f - x_i)$$

$$g = 9.8 \text{ m/s}^2$$

Chapter 3

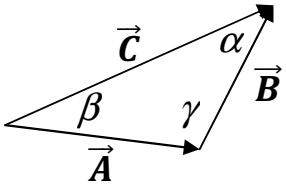
$$\vec{A} = A_x\hat{\imath} + A_y\hat{\jmath} \qquad A_x = A\cos\theta \qquad A_y = A\sin\theta$$

$$A = \sqrt{A_x^2 + A_y^2} \qquad \tan(\theta) = \frac{A_y}{A_x}$$



$$\vec{C} = \vec{A} + \vec{B} \qquad C_x = A_x + B_x \qquad C_y = A_y + B_y$$

$$C^2 = A^2 + B^2 - 2AB\cos\gamma \qquad \frac{\sin\alpha}{A} = \frac{\sin\beta}{B} = \frac{\sin\gamma}{C}$$



$$Ax^2 + Bx + C = 0 \quad \Rightarrow \quad x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

$$\sin^2\theta + \cos^2\theta = 1$$

Chapter 4

$$\vec{v}_{\text{avg}} = \frac{\Delta\vec{r}}{\Delta t} \qquad \vec{v} = \frac{d\vec{r}}{dt} \qquad \vec{a}_{\text{avg}} = \frac{\Delta\vec{v}}{\Delta t} \qquad \vec{a} = \frac{d\vec{v}}{dt}$$

Special Case: $\vec{v}_f = \vec{v}_i + \vec{a}t \qquad \vec{r}_f = \vec{r}_i + \vec{v}_i t + \frac{1}{2}\vec{a}t^2$

Special Case: $v = \frac{2\pi r}{T} \qquad a_c = \frac{v^2}{r}$

$$\vec{v}_{PA} = \vec{v}_{PB} + \vec{v}_{BA}$$