# Phys 218 – Fall 2018

## All *University Physics* Sections

## Exam I

**Short Answer:**

A) a) Cannot be correct: $\frac{\text{kg m}^2}{\text{s}^2}$ versus $\frac{\text{kg m}^2}{\text{s}^2} + \cancel{\frac{\text{m}}{\text{s}}\sqrt{\text{kg}}}$ [LO 10.1, 12.1]

b) Cannot be correct: $\frac{\text{m}}{\text{s}}$ versus $\frac{\text{m}}{\text{s}} + \cancel{\text{m}}$ [LO 10.2, 12.2]

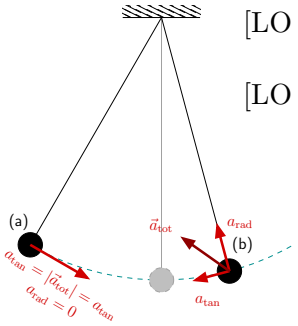
c) Cannot be correct: $\frac{\text{kg m}}{\text{s}^2}$ versus $\cancel{\frac{\text{m}^2}{\text{s}^2}}$ [LO 10.3, 12.3]

B) a) $\vec{A} \cdot \vec{B} = -8$ [LO 2.1]

b) $\vec{A} \times \vec{B} = 3\hat{i} - \hat{j} + 2\hat{k}$ [LO 2.2]

C) a) Purely tangential acceleration; since $v = 0$, $a_{\text{rad}} = 0$ [LO 13.1, 16.1, 17.1, 18.1]

b) Tangential and radial acceleration; total points up and to the left [LO 13.2, 16.2, 17.2, 18.2]




D) (a), it is slowing down and turning upwards.

**Problem 1:**

a) $v_1 = 5$ m/s [LO 3.1, 14.1]

b) $a = \frac{10}{7}$ m/s$^2$ [LO 3.2, 14.2]

c) $D = 60$ m [LO 3.3, 14.3, 20.1]

**Problem 2:**

a) $D = 640$ m [LO 3.4, 14.4, 20.2]

b) $v_{\text{car}} = 64$ m/s [LO 14.5, 20.3]

**Problem 3:**

a) $v = 30\,000$ m/s [LO 10.4, 16.3, 19.1]

b) $a = 0.006$ m/s$^2$ [LO 10.5, 16.4, 18.3, 19.2]

c) $R = 400\,000$ km [LO 16.5, 18.4, 19.3]

**Problem 4:**

a) $a_x(t) = (0.052\text{ m/s}^3)t$ and $a_y(t) = -4$ m/s$^2$ [LO 1.2, 8.1, 12.4]

b) $x(t) = -450\text{ m} + (7.3\text{ m/s})t + (0.0087\text{ m/s}^3)t^3$ and $y(t) = 5\,000\text{ m} - (2\text{ m/s}^2)t^2$ [LO 1.3, 8.2, 14.6]

c) $t_{\text{ground}} = 50$ s [LO 3.5, 14.7]