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| **Student:** _____ **Date:** _____ | **Instructor:** Joe Betters **Course:** Pre-Calculus Pre AP (Master Course) | **Assignment:** 6.2 Classwork Day 1 |

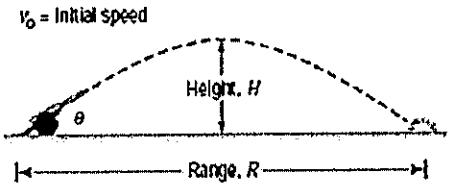
1. Find two negative and three positive angles, expressed in radians, for which the point on the unit circle that corresponds to each angle is $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$.

Choose the correct angles below.

- ○ **A.** $-\frac{31\pi}{6}, -\frac{19\pi}{6}, \frac{7\pi}{6}, \frac{19\pi}{6}, \frac{31\pi}{6}$
- ○ **B.** $-\frac{17\pi}{6}, -\frac{5\pi}{6}, \frac{7\pi}{6}, \frac{9\pi}{6}, \frac{31\pi}{6}$
- ○ **C.** $-\frac{22\pi}{3}, -\frac{7\pi}{3}, \frac{7\pi}{3}, \frac{19\pi}{3}, \frac{22\pi}{3}$
- ○ **D.** $-\frac{17\pi}{6}, -\frac{5\pi}{6}, \frac{7\pi}{6}, \frac{19\pi}{6}, \frac{31\pi}{6}$

2. The range R and the maximum height H of a projectile fired at an inclination $\theta$ to the horizontal with initial speed $v_0$ are given by the formulas below, where $g \approx 32.2$ feet per second per second is the acceleration due to gravity.

$$R(\theta) = \frac{v_0^2 \sin(2\theta)}{g} \qquad H(\theta) = \frac{v_0^2 (\sin\theta)^2}{2g}$$



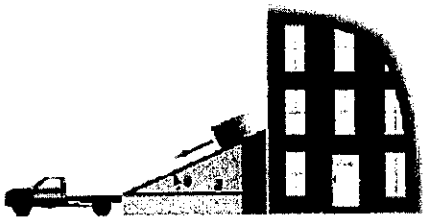

**A.** Find the range R if the projectile is fired at an angle of 45° to the horizontal with an initial speed of 140 feet per second.

$R \approx$ _____ feet (Round to two decimal places as needed.)

**B.** Find the maximum height H if the projectile is fired at an angle of 45° to the horizontal with an initial speed of 140 feet per second.

$H \approx$ _____ feet (Round to two decimal places as needed.)

3. If friction is ignored, the time t (in seconds) required for a block to slide down an inclined plane (see the figure) is given by the formula $t = \sqrt{\frac{2a}{g \sin\theta \cos\theta}}$, where a is the length (in feet) of the base and $g \approx 32$ feet per second per second is the acceleration due to gravity.



How long does it take a block to slide down an inclined plane with base a = 50 feet when $\theta = 60°$?

$t \approx$ _____ seconds
(Do not round until the final answer. Then round to two decimal places as needed.)

1. D. $-\frac{17\pi}{6}, -\frac{5\pi}{6}, \frac{7\pi}{6}, \frac{19\pi}{6}, \frac{31\pi}{6}$

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2. 608.70

   152.17

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3. 2.69

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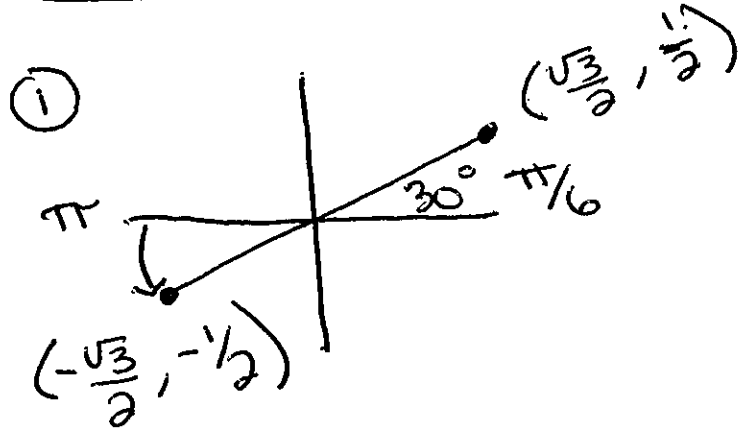
# 6.2 day 1 classwork

① 


$\pi + \frac{\pi}{6} = \frac{7\pi}{6}$

D

$\frac{7\pi}{6} + 2\pi k$

* $k=0$ $\frac{7\pi}{6}$
* $k=1$ $\frac{19\pi}{6}$
* $k=2$ $\frac{31\pi}{6}$

$\frac{7\pi}{6} - 2\pi k$

* $k=1$ $-\frac{5\pi}{6}$
* $k=2$ $-\frac{17\pi}{6}$

6.2 classwork day 1 continued

② $R(\theta) = \frac{V_0^2 \sin(2\theta)}{g}$ $\quad H(\theta) = \frac{V_0^2 (\sin\theta)^2}{2g}$

A) $45^\circ$, 140 ft/sec

$$R(45) = \frac{140^2 \sin((2)(45))}{32.2} = \boxed{608.70}\text{ ft}$$

B) $45^\circ$, 140ft/sec

$$H(45) = \frac{140^2 (\sin 45)^2}{2(32.2)} = \boxed{152.17}\text{ ft}$$

③ $t = \sqrt{\frac{2a}{g\sin\theta\cos\theta}}$ $\quad g \approx 32$ ft/sec

$a = 50$ft

$\theta = 60^\circ$

$$t = \sqrt{\frac{2(50)}{32\sin 60\cos 60}} = \sqrt{\frac{100}{32\left(\frac{\sqrt{3}}{2}\right)\left(\frac{1}{2}\right)}}$$

$$= \boxed{2.69}\text{ seconds}$$