

PROJECTILES & ENERGY

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College, Austin Texas USA. jpcise@austincc.edu & New York Times, June 8, 2018 by Richard C Paddock. Dedicated to the French Nation who helped USA during American Revolution 1776. Also, thanks to the British who established Singapore in 18th century.

Tightly Guarded, Singapore Battens Down for a Summit Meeting

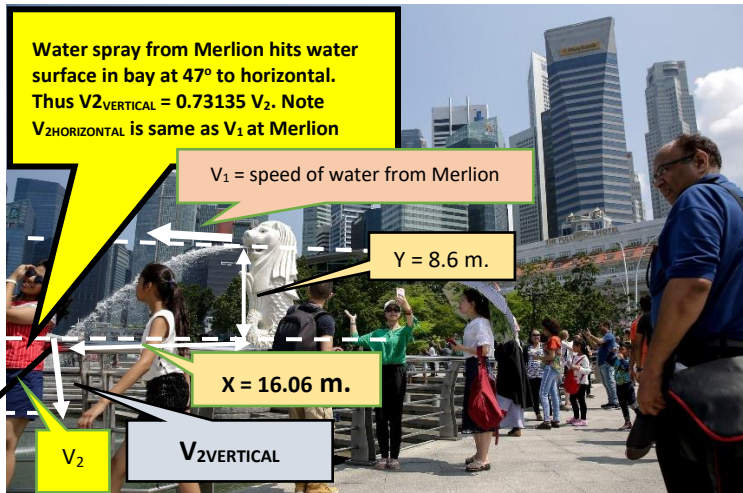


President Trump and Kim Jong-un are scheduled to hold their historic summit meeting at the Capella Singapore, a five-star hotel on the island of Sentosa.

SINGAPORE — For a couple of world leaders looking to get away to work on their relationship, Singapore has some obvious advantages. On the law and order front, bullhorns, banners, drones and spray paint have all been banned around the resort island where President Trump and Kim Jong-un, the leader of North Korea, are expected to hold their historic summit meeting on Tuesday.. Singapore’s strict security was a selling point in deciding the summit meeting’s location, and it has already come into play. The country’s history as a trading center and neutral diplomatic player also makes it one of the few places in the world with relatively cordial ties to both North Korea and the United States. [The American Chamber of Commerce of Singapore](#), for example, has more than 5,000 members representing more than 750 companies. Direct investment by American companies exceeds \$259 billion. Singapore also has ties with North Korea that date back to 1975, when the two countries established diplomatic relations. North Korea maintained low-level business operations here until November, when Singapore had to suspend trade under toughened United Nations sanctions.

INTRODUCTION: Goal of this application is to find speed of water emerging from Merlion statue (see lower left picture) in Singapore Harbor. Two ways the speed V_1 will be determined from projectile motion concepts and then by energy.

QUESTIONS: Lower left picture graphic contains useful data.(a) Use projectile ideas to find V_1 speed of water from Merlion? **HINT:** Break solution into horizontal and vertical parts. (b) Using energy conservation concept find $V_{2\text{VERTICAL}}$? **HINT:** Initial energy Vertical (gravitational potential energy) is conserved and transfers into Kinetic energy vertical. $m g h = \frac{1}{2} m (V_{2\text{VERTICAL}})^2$, (c) Find V_2 ?, **HINT** $\sin. 47^\circ = (V_{2\text{VERTICAL}})/V_2$, (d) Find $V_{2\text{HORIZONTAL}}$? **HINT:** $V_{2\text{VERTICAL}} = V_{2\text{HORIZONTAL}} \tan.47^\circ$ (e) Find $V_1 =$ water speed emerging from Merlion in Singapore harbor?, (f) Comment on answer (e) vs answer (a)?



ANSWERS: (a) $V_1 = \sim 12.13 \text{ m./s.}$,
 (b) $V_{2\text{VERTICAL}} = 13 \text{ m./s.}$, (c) $V_2 = 17.78 \text{ m./s.}$,
 (d) $V_{2\text{HORIZONTAL}} = 12.126 \text{ m./s.}$,
 (e) $V_1 = \sim 12.126 \text{ m./s.} = \text{same as } V_{2\text{HORIZONTAL}}$
 (f) $V_1 = V_{2\text{HORIZONTAL}}$ since horizontal component of a projectile stays the same throughout it’s path since no force in horizontal direction the acceleration is zero and thus velocity is a constant. We are assuming no frictional forces in the horizontal X direction. In reality some frictional forces exist in X direction thus affecting Horizontal velocity.

Singapore has been a center of commerce and exchange for centuries.

The meeting will be at the Capella Singapore, a five-star hotel on Sentosa, a triangle-shaped island that was once most famous for being a haven for pirates. In those days it was known as Pulau Blakang Mati, literally the “Island Behind Death.”