FASTly
FAITH & SCIENCE TEACHING

Projectile Motion (2D Kinematics) Practice Calculations

Teacher Instructions: Cut the three problems below apart. Each pair or group of students should be given just one of the three versions of the problem. Do not tell students that they have different versions of the problem until all students have arrived at a numerical answer. All numerical answers are the same since the same initial conditions are given. (Students should ignore the effect of air resistance when calculating an answer and assume a constant vertical acceleration of 9.8 m/s/s downward.)

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A projectile is launched with a horizontal speed of 55 m/s from a height of 250 meters.

    a. Calculate the horizontal displacement of the projectile from the time it is dropped until it strikes the ground.

    b. Calculate the vertical speed of the projectile upon landing.

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Boxes containing first aid supplies, clean water, and food are being dropped to survivors of a tsunami from an airplane flying at a speed of 55 m/s and an altitude of 250 meters.

a. Calculate how far (horizontally) in advance of the survivors the box must be dropped.

b. Calculate how fast (vertically) the box will be falling upon impact with the ground assuming it is not equipped with a parachute.

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Planners of a military strike aim to drop a bomb on an enemy installation populated by both combatants and civilian workers. It will be dropped from a plane flying at a speed of 55 m/s and an altitude of 250 meters.

a. Calculate how far (horizontally) in advance of the camp the bomb must be dropped.

b. Calculate how fast (vertically) the bomb will be falling upon impact with the ground.