**GSE Algebra 2 Unit 4: Rational and Radical Relationships**

**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Unit: 4C** | **Homework**: **3** |
| **Standard**:   * **MCC9**-**12.A.REI.2** Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. | |
| **Essential Question:**   * How can you find a solution to an equation involving radicals? | |
| **Key Words**:  Radical equation, radical expression | |
| **Recommended Resources:**  www.walch.com/rr/00201  www.walch.com/rr/00203  www.walch.com/rr/00206 | |
| 1. When an object is dropped from a great height gravity causes the object to speed up as it falls. When the object strikes the surface, the velocity at which the object was traveling at the moment of impact (ignoring air resistance) can be determined using the formula , where v represents the object’s velocity (in feet per second), g is the object’s acceleration due to gravity (in feet per second per second), and h is the height of the object (in feet). On Earth, an object’s acceleration due to gravity is 32 ft/s2. From what height must a stone be dropped to reach a velocity of 128 ft/s at the moment it hits the ground? | |
| 1. The time it takes an object to fall from a great height depends on the object’s acceleration due to gravity, as well as the height from which the object is dropped. The formula  can be used to describe this relationship, with t representing time (in seconds), h representing the height of the object (in feet), and g representing the object’s acceleration due to gravity, which is 32 ft/s2. If a cliff diver leaps into the water from a height of 164 feet, how long will it take him to reach the water? Assume that air resistance is negligible and does not have an effect. | |
| 1. The time *T* in seconds that it takes a pendulum to make a complete swing back and forth is given by the formula, where *L* is the length of the pendulum in feet and *g* is the acceleration due to gravity, 32 feet per second squared. In Tokyo, Japan, a huge pendulum in the Shinjuku building measures 73 feet   9.75 inches. How long does it take for the pendulum to make a complete swing? | |
| 1. The time *T* in seconds that it takes a pendulum to make a complete swing back and forth is given by the formula, where *L* is the length of the pendulum in feet and *g* is the acceleration due to gravity, 32 feet per second squared. A clockmaker wants to build a pendulum that takes 20 seconds to swing back and forth. How long should the pendulum be? | |
| 1. In an electrical circuit, the current is related to the power and resistance according to the rule , where I represents the current (measured in amps), P represents power (measured in watts), and R represents resistance (measured in ohms). What is the electrical power drawn by a device that has a resistance of 15 ohms with a current of 4 amps? | |
| 1. The power *P* in watts that a circular solar cell produces and the radius of the cell in centimeters are related by the square root equation  . About how much power is produced by a cell with a radius of 10 cm? | |
| 1. The voltage *V* required for a circuit is given by , where *P* is the power in watts and *R* is the resistance in ohms. How many more volts are needed to light a 100-watt light bulb than a 75-watt light bulb if the resistance of both is 110 ohms? | |
| 1. Isabel accidentally dropped her keys from the top of a Ferris wheel. The formula  describes the time *t* in seconds at which the keys are *h* meters above the ground and Isabel is *d* meters above the ground. If Isabel was 65 meters high when she dropped the keys, how many meters above the ground will the keys be after 2 seconds? | |