AP Calculus Name: _____
6.0 Worksheet A | Proportionality

Answer in complete sentences.
1. Define direct proportionality.

2. Define inverse proportionality.

3. An object's weight on earth, E, is proportional to its weight on the moon, M. Neil Armstrong, the first person to step on the moon, weighed 360 pounds on Earth (with all of his equipment) and weighed 60 pounds on the moon. a. Write the equation relating E and M. b. How much would a 126-pound person weigh on the moon?

4. Boyle's law tells us that the volume of a gas, V, is inversely proportional to its pressure exerted on it, P. When a gas experiences a pressure of 42 pounds per square inch (psi), its volume is 25 cubic centimeters. a. Write the equation relating V and P. b. What would its volume be if it experiences a pressure of only 34 psi?

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5. $H = \frac{12T^3}{\sqrt{D}}$ 6a. $B = \frac{703W}{H^2}$ 6b. 24.390

□5. H is directly proportional to the cube of T and inversely proportional to the square root of D. H is 375 when T is 5 and D is 16. Write the equation relating H, T and D.

□6. Body-mass index, or BMI, takes both weight and height into account when assessing whether an individual is underweight or overweight. BMI, or B, is proportional to a person's weight in pounds, W, and inversely proportional to the square of the person's height in inches, H. In adults, normal BMI values are between 20 and 25. A person who weighs 180 pounds and is 5 feet tall (or 60 inches), has a BMI of 35.15. a. Write the equation relating B, W, and H. b. What is the BMI, for a 170-pound person who is 5 feet 10 inches tall (or 70 inches)?

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1. Two quantities x and y are directly proportional if and only if there exists some constant k such that $y = kx$. 2. Two quantities x and y are inversely proportional if and only if there exists some constant k such that $y = \frac{k}{x}$. 3a. $E = 6M$ 3b. 21 pounds 4a. $V = \frac{1050}{P}$ 4b. 30.882 cm^3