

Bungee Jumping With a Toy Doll – Solutions

Answers will vary, depending on the height and weight of the doll and the size and strength of the rubber bands. In one typical experiment, students found the slope of the line to be about 22 and the y-intercept to be about 17, yielding an equation of $y = 22x + 17$.

1. The independent variable (x) represents the number of rubber bands in the bungee cord.
2. The dependent variable (y) represents the distance in centimeters that the doll's head (or hair) falls below the drop point.
3. The slope of the line represents the change in falling distance per additional rubber band.

4. Determine how low the doll's head would reach if the bungee cord were made of:

a. 20 rubber bands

b. 100 rubber bands

$$22(20) + 17 = 457 \text{ cm}^*$$

$$100(20) + 17 = 2017 \text{ cm}^*$$

* Due to experimental error, these distances should be rounded to the nearest 10 cm.

5. How many rubber bands would you need to use so that the doll's head would fall:

a. 5 meters below the drop point

b. 10 meters below the drop point

$$22x + 17 = 500$$

$$22x + 17 = 1000$$

$$x = 21.95 \text{ or about } 22 \text{ rubber bands}$$

$$x = 44.68 \text{ or about } 45 \text{ rubber bands}$$

6. When dropping the doll from a high location, so that it will fall as low as possible without hitting the ground, students will need to round the number of rubber bands to the next LOWER integer.
7. A heavier doll will cause each rubber band to stretch farther. Therefore, fewer rubber bands will be needed to achieve the same falling distances.