

WEIGHT ON A STRING Teaching Guidelines

Subject: Mathematics

Topics: Algebra--Equations and Expressions; Powers, Roots and Scientific Notation

Grades: 9 - 12

Knowledge and Skills:

- Can evaluate expressions by substituting values for variables
- Can simplify expressions using correct order of operations
- Understands the function of grouping symbols in an expression
- Understands the concept "root"

Materials: None

Answers

L	d	How far down will the weight hang?
10 inches	8 inches	3 inches
100 cm	50 cm	43 cm
25.4 cm	20.1 cm	7.76 cm
200 feet	195 feet	22.2 feet
1.2 x 10 ³ meters	9.8 x 10 ² meters	346 meters

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Weight on a String Skill Set

In the diagram below, a weight is hung from the center of a string of length *L* which is stretched between two points separated by distance *d*.



The weight will hang down by a distance that is given by this expression:

$$\sqrt{\left(\frac{L+d}{2}\right)\left(\frac{L-d}{2}\right)}$$

1. Put these operations in the order in which they should be done according to the above expression:

Divide by 2 Take the square root Add or subtract L and d Multiply

2. Compute the value of the expression above for the given values of L and d:

L	d	How far down will the weight hang?
10 inches	8 inches	
100 cm	50 cm	
25.4 cm	20.1 cm	
200 feet	195 feet	
1.2 x 10 ³ meters	9.8 x 10² meters	

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