

Linear functions can be used to describe the action of springs that stretch, like those in telephone cords, and springs that compress, like those in a mattress or bathroom scale. Hooke's Law in science says that, for an ideal coil spring, the relationship between weight and length is perfectly linear, within the elastic range of the spring.

The table below shows data from an experiment to test Hooke's Law on different coil springs.

Spring 1Spring 1Spring 1Spring 1

$$Y = 1/2x + 12$$

$$Y = x + 5$$

$$Y = -x + 18$$

$$Y = 1/2x + 12$$

For each spring:

- a. Identify the length of the spring with no weight applied

Spring 1: 12

Spring 3: 18

Spring 2: 5

Spring 4: 12

- b. Describe the rate of change of the length of the spring as weight is increased. Indicate units.

Spring 1: 1/2x

Spring 3: -x

Spring 2: x

Spring 4: -1/2x

- c. Spring 1: Next = Now 1/2 Start @ 12
Spring 2: Next = Now 1 Start @ 5
Spring 3: Next = Now -1 Start @ 18
Spring 4: Next = Now -1/2 Start @ 12

- d. Spring 1: $y = \underline{1/2x + 12}$
Spring 2: $y = \underline{x + 5}$
Spring 3: $y = \underline{-x + 18}$
Spring 4: $y = \underline{-1/2x + 12}$