

1. In 2005, Joe planted a tree that was 3 feet tall. In 2010, the tree was 13 feet tall. Assuming the growth of the tree is linear, what was the rate of the growth of the tree?

$$\frac{\Delta Y}{\Delta X} = \frac{\Delta \text{feet}}{\Delta \text{year}} = \frac{10 \text{ ft}}{5 \text{ years}} = \frac{2 \text{ feet}}{1 \text{ year}}$$

2 feet per year

2. In 1995, a public library had 16,000 books on its shelves. In 1999, the library had 19,000 books. Assuming a linear increase, how many books were added to the library each year?

$$\frac{\Delta Y}{\Delta X} = \frac{\Delta \text{Books}}{\Delta \text{years}} = \frac{3,000}{4 \text{ years}} = \frac{750 \text{ books}}{1 \text{ year}}$$

3. Monica feeds her dog the same amount of dog food each day from a very large bag. On the 3rd day, she has 44 cups left in the bag, and on the 11th day she has 28 cups left. How many cups of food does she feed her dog each day?

$$\frac{\Delta Y}{\Delta X} = \frac{\Delta \text{cups}}{\Delta \text{day}} = \frac{-16 \text{ c.}}{8 \text{ days}} = \frac{-2 \text{ cups}}{1 \text{ day}}$$

She feeds the dog
2 cups per day

4. Wendy bought a car for \$25,000 and its value depreciated linearly. After 3 years, the value was \$21,250. What was the amount of yearly depreciation?

$$\frac{\Delta Y}{\Delta X} = \frac{\Delta \$}{\Delta \text{year}} = \frac{-\$3,750}{3 \text{ years}} = -\$1250 \text{ per year}$$

5. Jamal's parents give him \$20 to spend at camp. Jamal spends the same amount of money on snacks each day. After 4 days, he has \$12 left. How much money is he spending each day?

$$\frac{\Delta Y}{\Delta X} = \frac{\Delta \$}{\Delta \text{day}} = \frac{-\$8}{4 \text{ days}} = -\$2 \text{ per day}$$

6. A climber is on a hike. After 4 hours he is at an altitude of 900 feet. After 7 hours, he is at an altitude of 2700 feet. What is the average rate of change?

$$\frac{\Delta Y}{\Delta X} = \frac{\Delta \text{feet}}{\Delta \text{hour}} = \frac{1800 \text{ ft}}{3 \text{ hours}} = \frac{600 \text{ ft.}}{\text{per hour}}$$

7. A teacher weighed 145 lbs in 1986 and weighs 190 lbs in 2007. What was the rate of change in weight?

$$\frac{\Delta Y}{\Delta X} = \frac{\Delta \text{lbs}}{\Delta \text{yr}} = \frac{45 \text{ lbs}}{21 \text{ years}} = \frac{15 \text{ lbs}}{7 \text{ years}}$$

OR
2.14 lbs per year