0.3 Prelude: Percentages

Practice exercises

did you do this?

On each problem, write down what you enter into your calculator and don't forget to write the units on your final answer. You are welcome to calculate the answer step-by-step but also challenge yourself to figure out the answer all at once, not hitting = on your calculator until the very end.

1. As I write this problem, the population of the world is 8,056,959,718 people (just over 8 billion). It changes by the second, so let's use the round figure of 8,100,000,000.

   (a) I read that the population of Brazil accounts for 2.69% of the world's population. According to that report, what is the population of Brazil? Round your answer to the nearest million.

   2.69 ÷ 100 = .0269
   .0269 × 8100000000 = 217,890,000

   OR 2.69 ÷ 100 × 8100000000 =

   Brazil's population is around 218,000,000 (218 million) people

   (b) If the population of the United States is currently around 334,000,000, what percentage of the world's population is in the United States?

   334000000 ÷ 8100000000 = .0412...
   .0412... × 100 = 4.12... % ≈ 4.12%

   OR 334000000 ÷ 8100000000 × 100 =

   The U.S. population accounts for 4.12% of the world's population.

2. In Minneapolis, apartment rent is expected to increase by 16% next year.

   (a) Astra lives in a 1-bedroom apartment where they pay $825 per month in rent. If their rent increased by 16% what would their new rent be?

   16 ÷ 100 = .16
   .16 × 825 = 132
   825 + 132 = 957

   Astra's rent will be $957/month

   OR 825 + 16 ÷ 100 × 825 =

   (b) Lucky for Astra, their building is subject to rent stabilization laws and so their rent cannot increase by more than 3%. What would their new rent be?

   3 ÷ 100 = .03
   .03 × 825 = 24.75
   825 + 24.75 = 849.75

   Astra's rent would be $849.75 instead.

   OR 825 + 3 ÷ 100 × 825 =

   Yes—your calculator knows to do × and ÷ before the +

3. The corner by my house is dangerous. One year there were 14 accidents there. The neighbors got together and petitioned to have 4-way stop signs installed.

   (a) The city estimated that the installed stop signs would reduce accidents at least 40%. If that happens, how many accidents would we expect the next year?

   40 ÷ 100 = .40
   .40 × 14 = 5.6
   14 − 5.6 = 8.4

   We would expect 8 or 9 accidents the next year.

   OR 14 − 40 ÷ 100 × 14 =

   Yes, in one line version your calculator knows to do the ÷, × before the −

   (b) The national average shows that the new signs could reduce accidents up to 62%. If that happens instead, how many accidents would we expect the next year?

   62 ÷ 100 = .62
   .62 × 14 = 8.68
   14 − 8.68 = 5.32

   We would expect 5 or 6 accidents the next year instead.

   OR 14 − 62 ÷ 100 × 14 =

   (c) If there were 6 accidents the next year, is that in the range you figured out? What percent decrease does that correspond to?

   OR 8 ÷ 14 × 100 =

   Yes, not quite 62% decrease.
   # less = 14 − 6 = 8
   decrease = $\frac{8}{14}$ = 8 ÷ 14 = .5714...
   % decrease = .5714... × 100 = 57.14... ≈ 57%

4. My savings account earns a modest amount of interest, the equivalent of .75% annually. I have $12,392.18 in the account now.

   Story also appears in 2.2#4

   (a) How much interest will I earn this year?

   Looks strange but that's correct!

   .75 ÷ 100 = .0075
   .0075 × 12392.18 = 92.94135 ≈ $92.94 interest

   OR .75 ÷ 100 × 12392.18 =

   (b) How much will my account balance be at the end of the year?

   12392.18 + 92.94 = 12485.12

   I will have ≈ $12,485.12 in my savings account