

Section 3A: Homework Solutions

August 31, 2005

Do the following make sense:

8. The value of our home has tripled since we bought it—that is a 200% increase in value!

Solution:

This statement **makes sense**. Consider a \$100 home. If it tripled in price, it would cost \$300, which is also a 200% increase in the initial value.

□

9. My older child weighs 25% more than my younger child.

Solution:

This statement **makes sense**.

□

For each of the following, express the number as a fraction, decimal, and percent:

17. $\frac{1}{4} = .25 = 25\%$

20. $0.652 = 65.2\% = \frac{652}{1000} = \frac{163}{250}$

25. $\frac{1}{8} = .125 = 12.5\%$

28. $1.01 = 101\% = \frac{101}{100}$

31. $99\% = .99 = \frac{99}{100}$

Compare the following in three ways: (i) Find the ratio of A to B . (ii) Find the ratio of B to A . (iii) Complete the statement (find x): A is x percent of B .

33. $A = 10$ and $B = 2$

Solution:

(i) $A/B = 5$

(ii) $B/A = 1/2$

(iii) A is 500% of B

□

38. $A = 33$ and $B = 123$

Solution:

- (i) $A/B = 33/123 \approx .268$
- (ii) $B/A = 123/33 \approx 3.73$
- (iii) A is 26.8% of B

□

Express the first number as a percentage of the second in the following:

49. 23 purple jelly beans in a jar of 123 jelly beans:

Solution:

$23/123 = .187$ so 23 is 18.7% of 123.

□

50. 2345 people who voted for the winning candidate out of 4023 voters:

Solution:

$2345/4023 = 0.5829$ so 2345 is 58.29% of 4023.

□

54. Find the absolute and relative change for the following:

Consumer debt in the United States increased from \$130 billion in 1974 to \$1.75 trillion in 2003.

Solution:

To find the absolute increase we convert units to billions and subtract the changed value from the original: $1750 - 130 = 1620$.

To find the relative increase we divide the above by the initial debt:
 $1620/130 \approx 12.46$.

□

59. Assuming that the first quantity is the compared value, find the absolute and relative difference in each of the following:

In a recent year, France ranked as the number one tourist destination, with about 66 million international arrivals. The United States ranked second, with about 48 million.

Solution:

Since the U.S figure is the compared value, we find the relative difference to be $66 - 48 = 18$ million international arrivals.

Dividing this value by the reference value we compute the relative difference to be $18/48 = .375 = 37.5\%$.

□

66. Fill in the x and explain your reasoning in the following:
Henry earns 45% less than Ingrid, so his salary is $x\%$ of Ingrid's Salary.

Solution:

Henry earns $\frac{100-45}{100}$ times what Ingrid earns, so his salary is 55% of hers.

□

68. Fill in the x :

A store is having a 15% off sale. Therefore, a sale price is x times an item's original price.

Solution:

The sale price is $100-15=85\%$ of the original price.

□

Express the following in two ways: (i) as an absolute difference in terms of percentage points and (ii) as a relative difference in terms of a percentage.

72. In a 25-year period, the percentage of the world's population living in developed countries decreased from 27% to 20%.

Solution:

The absolute difference is $20\% - 27\% = -7\%$ which is can be read: The population decreased seven percentage points.

The relative difference is $\frac{-7\%}{27\%} \approx 25.9\%$ which can be read: The population decreased 25.9%.

□

73. In the past four decades, the five-year survival rate for all forms of cancer increased from 39% to 60%.

Solution:

The absolute difference is 21 percentage points.

The relative difference is $21/39 \approx .538 = 53.8\%$.

80. The final cost of your new HDTV is \$3706.30. The local sales tax rate is 8.1%. What was the pre-tax price?

Solution:

From the above information we write the equation

$$3706.30 = C + .081C$$

and solve for $C = 3428.58$. Note that the above equation says: The price after tax (3706.30) is equal to the price before tax (C) plus the cost of tax ($.081C$).

□