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| **Word Problems: Proportions** |
| |  | | --- | | In order to solve problems involving proportions, you should be able to:     * work with fractions * set up [ratios](http://www.algebralab.org/Word/Word.aspx?file=Algebra_Ratios.xml) * set up equivalent fractions * cross multiply * solve [one-step equations](http://www.algebralab.org/lessons/lesson.aspx?file=Algebra_OneVariableMultiStep.xml)     A [proportion](javascript:def('/Glossary/glossaryterm.aspx?word=Proportion',%20500,%20500);) sets two ratios equal to each other. In one ratio, one of the quantities is not known. You then use cross multiplication and solve the [equation](javascript:def('/Glossary/glossaryterm.aspx?word=Equation',%20500,%20500);) for the missing value.  Suppose it takes 48 chicken fingers to feed Mr. Young’s 4th grade class of 20 students. How many chicken fingers would be needed for 30 students?    There are several ways to approach this problem. Most students feel that the easiest way is to set up a [ratio](javascript:def('/Glossary/glossaryterm.aspx?word=Ratio',%20500,%20500);) with the first piece of information given in the problem. In this problem, the [ratio](javascript:def('/Glossary/glossaryterm.aspx?word=Ratio',%20500,%20500);) would be http://www.algebralab.org/img/5fa11429-68db-458a-8275-29459d5f9d73.gif. According to the problem, it takes 48 chicken fingers for 20 students which can be expressed as the [ratio](javascript:def('/Glossary/glossaryterm.aspx?word=Ratio',%20500,%20500);) http://www.algebralab.org/img/a1b43826-55a7-4cea-aa7b-b92c6b681793.gif. Now we need to set up the second [ratio](javascript:def('/Glossary/glossaryterm.aspx?word=Ratio',%20500,%20500);) for the larger group of students keeping in mind that the number of chicken fingers goes in the numerator and the number of students goes in the denominator. We do not know the number of students, so we can call it *x*. The number of students is 30. This gives the [ratio](javascript:def('/Glossary/glossaryterm.aspx?word=Ratio',%20500,%20500);) http://www.algebralab.org/img/d5be78e6-92ad-42bb-9ab2-d783486cb2d6.gif. Solving a [proportion](javascript:def('/Glossary/glossaryterm.aspx?word=Proportion',%20500,%20500);) means that we are now going to set the two ratios equal to each other and solve.    http://www.algebralab.org/img/33ca21d6-50c3-497e-9ec0-b98abd634ec0.gif    So it will take 72 chicken fingers to feed 30 students.    It is helpful to set up the [ratio](javascript:def('/Glossary/glossaryterm.aspx?word=Ratio',%20500,%20500);) in words before using numbers so that you are consistent. You could have set up the previous problem in other ways, but as long as you were consistent with your ratios your answer should still be 72. | | |  |  | | --- | --- | |  | | |  |  | |  | |  |  |  | | --- | --- | --- | | **Question #1** | | | |  | [Audio](mms://www.algebralab.org/algebralab/audio/word/Algebra_Proportions_q1.mp3) | David read 40 pages of a book in 50 minutes. How many pages should he be able to read in 80 minutes? |  |  |  |  | | --- | --- | --- | | **Question #2** | | | |  | [Audio](mms://www.algebralab.org/algebralab/audio/word/Algebra_Proportions_q2.mp3) | Jeannie takes inventory of her closet and discovers that she has 8 shirts for every 5 pair of jeans. If she has 40 shirts, how many pairs of jeans does she have? | | |  | |  |  |  | | --- | --- | |  | | |  |  | |  | |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  |  |  |  | | **Question #3** | | | | | | http://www.algebralab.org/images/spacer.gif | [Audio](mms://www.algebralab.org/algebralab/audio/word/Algebra_Proportions_q3.mp3) | If 4 grapefruits sell for 79 cents, how much will 6 grapefruits cost? | | | |  | A. $1.18 | | | | |  | B. $1.19 | | | | |  | C. 30 cents | | | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  |  |  |  | | **Question #4** | | | | | | http://www.algebralab.org/images/spacer.gif | [Audio](mms://www.algebralab.org/algebralab/audio/word/Algebra_Proportions_q4.mp3) | Jim found out that after working for 9 months he had earned 6 days of vacation time. How many days will he have earned after working for two years? | | | |  | A. 36 days | | | | |  | B. http://www.algebralab.org/img/ad9aa837-0e38-4787-8eb5-c9de8b2bb3b2.gifdays | | | | |  | C. 16 days | | | | | | |