

Substitution in the proportion $\frac{P}{100} = \frac{A}{B}$ gives

$$\begin{aligned}\frac{30}{100} &= \frac{A}{2500} \\ 30 \cdot 2500 &= 100 \cdot A \\ \frac{75,000}{100} &= \frac{\cancel{100} \cdot A}{\cancel{100}} \\ 750 &= A.\end{aligned}$$

So in a healthy diet of 2500 calories per day, no more than 750 calories should be derived from fat.

Now work margin exercise 4.

Example 5 Application: Finding the Percent

Greg is hoping to raise \$750 for a charity bicycle ride. Currently, his friends and family have donated \$330 toward the cause. What percent of his goal has he reached?

Solution

Greg has raised \$330 towards his goal. We want to find what percent this amount is of \$750. So, with $B = \$750$ and $A = \$330$, We want to find the value of P . Substitution in the proportion $\frac{P}{100} = \frac{A}{B}$ gives

$$\begin{aligned}\frac{P}{100} &= \frac{330}{750} \\ P \cdot 750 &= 100 \cdot 330 \\ \frac{P \cdot \cancel{750}}{\cancel{750}} &= \frac{33,000}{750} \\ P &= 44\end{aligned}$$

Greg has reached 44% of his goal.

Now work margin exercise 5

Margin Exercise Answers

1. 12 2. 500 3. 22% 4. 18 g 5. 40%

5. Angela is shopping for a new tablet. Of the 15 different tablets she is considering, only 6 have a rear-facing 8-megapixel camera. What percent of the tablets have this type of camera?

4.5 Exercises

Concept Check

Fill-in-the-Blank. Complete each sentence using information found in this section.

- Using a proportion equation, $P\%$ represents _____ and is written as the ratio $\frac{P}{\underline{\hspace{1cm}}}$.
- In the proportion equation $\frac{P}{100} = \frac{A}{B}$, the letter A represents _____, or part of the base.

3. In the proportion $\frac{P}{100} = \frac{172.3}{150}$, _____ represents the amount.
4. In the proportion $\frac{56}{100} = \frac{A}{542}$, _____ represents the percent.
5. For the question “What is 95% of 60?” the corresponding proportion would be _____.

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

6. Percent problems can be solved with a proportion if two of the three parts P , A , and B are known.
7. In the proportion $\frac{P}{100} = \frac{65}{200}$, the base is 65.
8. In the problem “What is 26% of 720?” the missing number is the base.
9. Because the base represents the whole, it is always larger than the amount.

Practice

Use the proportion $\frac{P}{100} = \frac{A}{B}$ to find each unknown quantity. Round percents to the nearest tenth of a percent. All other answers should be rounded to the nearest hundredth, if necessary. See Examples 1 through 3.

1. Find 15% of 50.
2. What is 85% of 60?
3. 25% of 60 is _____.
4. 40% of 45 is _____.
5. 80% of 80 is _____.
6. 10% of 90 is _____.
7. Find 100% of 47.
8. Find 100% of 83.
9. 27 is 3% of what number?
10. 5 is 2% of what number?
11. 30% of _____ is 45.
12. 50% of _____ is 35.
13. 100% of _____ is 62.
14. 150% of _____ is 69.
15. What percent of 50 is 10?
16. What percent of 48 is 12?
17. What percent of 50 is 75?
18. What percent of 14 is 42?
19. _____% of 44 is 66.
20. _____% of 56 is 140.
21. _____% of 70 is 21.
22. _____% of 90 is 72.
23. 75% of 32 is _____.
24. 25% of 64 is _____.
25. What percent of 15 is 5?
26. What percent of 54 is 18?
27. _____% of 120 is 48.
28. _____% of 100 is 38.
29. 14 is 20% of what number?
30. 32 is 20% of what number?

31. 23 is ____% of 10.
32. 18 is ____% of 10.
33. Find 5% of 72.
34. Find 60% of 42.
35. What number is 50% of 35?
36. What number is 30% of 85?
37. 76.8 is 15% of what number?
38. 142.6 is 23% of what number?
39. 78 is 120% of what number?
40. 200 is 125% of what number?
41. 20.25 is 25% of ____.
42. 43.68 is 84% of ____.
43. What percent of 100 is 66.5?
44. What percent of 100 is 24.9?
45. Find 13.5% of 95.
46. Find 18.5% of 345.
47. What percent of 160 is 200?
48. What percent of 120 is 258?
49. ____ is 96% of 35.
50. ____ is 17% of 425.
51. 150% of 70 is ____.
52. 250% of 52 is ____.
53. 86.5% of what number is 100?
54. 68.5% of what number is 27?
55. 440 is 110% of what number?
56. 450 is 150% of what number?
57. 48 is ____% of 24.
58. 92 is ____% of 23.
59. 179.2 is ____% of 640.
60. 132.6 is ____% of 390.
61. 40 is $33\frac{1}{3}$ % of ____.
62. 8 is $66\frac{2}{3}$ % of ____.

Applications

Solve.

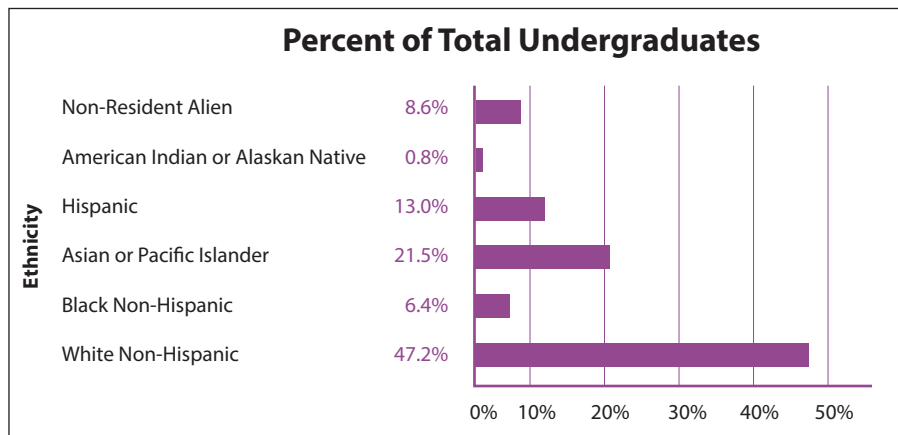
63. In 2016, the Los Angeles Dodgers led the major leagues in home attendance, drawing an average of 45,720 fans to their home games. This figure represented 81.64% of the capacity of Dodger Stadium. Estimate how many fans the stadium can hold (to the nearest ten) when it is filled to capacity. ¹
64. Baldwin-Wallace College, a small liberal arts college in Ohio, had a total enrollment of 3332 students in the 2021–2022 school year. Of that number, 83.1% of the students were undergraduates. How many undergraduates were enrolled at Baldwin-Wallace College in 2021–2022? Round your answer to the nearest whole number. ²
65. Within the borders of West Virginia, the length of Interstate 77 is 186 miles. Of this, 88 miles is a toll road. What percentage of Interstate 77 in West Virginia is a toll road? Round your answer to the nearest hundredth of a percent.
66. While Ashley Johnston was on the TV show “The Biggest Loser,” she dropped her weight to 191 pounds, which was 51.45% of her starting weight. What was her starting weight? Round your answer to the nearest pound. ³

¹ Source: [espn.com/mlb/attendance](https://www.espn.com/mlb/attendance)

² Source: “About,” Baldwin Wallace University, www.bw.edu/about

³ Source: [msnbc.msn.com/id/35487357/ns/health-fitness](https://www.msnbc.msn.com/id/35487357/ns/health-fitness)

67. You want to purchase a new home for \$122,000. The bank will loan you 80% of the purchase price. How much will the bank loan you? (This amount is called your mortgage and you will pay it off over several years with interest. For example, a 30-year loan will probably cost you a total of more than 3 times the original loan amount.)
68. Two people dined at the La Fiesta Mexican Grill where the food cost was \$31.18. To that, a tax of \$3.43 was added. What is the percentage of this tax? Round your answer to the nearest tenth of a percent.
69. A kicker on a professional football team made 45 of 48 field goal attempts.
 - a. What percent of his attempts did he make?
 - b. What percent did he miss? Would you keep this player on your team or trade for a new kicker?
70. In one season, a basketball player missed 15% of her free throws. How many free throws did she attempt if she made 136 free throws?
71. In one tennis match, Andy served an “ace” on 15% of his serves. If he served 180 times, how many aces did he serve?
72. The University of Southern California has a total of 16,897 undergraduate students. Find the number of students in each of six groups using the percents shown in the graph below. Round each answer to the nearest whole number.⁴



73. Find the percent of women in each of the 5 branches of the military from the data shown in the following table. Round each answer to the nearest hundredth of a percent.

Component	Military	Female
Army	561,979	75,507
Marine Corps	202,612	13,493
Navy	323,139	51,385
Air Force	329,640	63,310
Coast Guard	41,327	6,790

Writing & Thinking

74. List the four parts of the proportion equation and give a brief definition of each one.
75. Can a mixed number be used in a proportion? Justify your answer.

⁴ Source: education-portal.com/directory/school/University_of_Southern_California.html