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## Percentages

### Basic problems

**1. Write each fraction as a percent. Round to the nearest hundredth of a percent.**

1. $\frac{48}{5}$	2. $\frac{4}{13}$	3. $\frac{16}{25}$	4. $\frac{1}{4}$
5. $\frac{12}{25}$	6. $\frac{21}{100}$	7. $\frac{3}{10}$	8. $\frac{3}{5}$

**2. Convert the numbers.**

1. fraction $\frac{3}{8}$ percent	2. percent 50% decimal	3. percent 20% fraction
4. decimal 0.8 fraction	5. fraction $\frac{4}{7}$ percent	6. fraction $\frac{12}{5}$ decimal

**3. Evaluate.**

1. 192% of 350	2. 30% of 90	3. 104% of 250
4. 30% of 350	5. 50% of 460	6. 24% of 450

### Challenge problems

1. After increasing each side by 20%, the area of a square is  $288 \text{ cm}^2$ . What was the original area?
2. Donald can pick 25% more apples than Roman does in the same amount of time. If they can pick 90 apples in an hour working together, how long would it take Donald to pick 120 apples?
3. An organization has 32 members. It hopes to increase the membership by 50% each year. If they succeed at it, how many members will the organization have after 5 years of growth?
4. If the income tax on your earnings is \$1380 plus 20% of the amount above \$8000, how much tax would you pay on earnings of \$10200?

5. A class of 20 students achieved an average of 66% on an exam. Another class of 30 students achieved an average grade of 56% on the same exam. What is the average for the combined classes?
6. The capacity of a tank sprayer is 4000 liters. If 200 liters of water is mixed with 50 liters of herbicide for each acre sprayed, how many acres can be sprayed if the tank is 75% full in the beginning of the operation?
7. Mr. Martin bought two balls which he then resold at \$1.20 each. Based on the cost of the balls (the price he paid), Mr. Martin made a profit of 20% on one ball and encountered a loss of 20% on the other ball. Overall, how much money did he make?
8. A television set is on sale at a reduced price of \$200. What was the initial price if the first discount was 20% and another special promotion reduced it by another 20%?

9. During a sale, the price of a book is reduced by 25%. The sale price is then further reduced by 40%. What is the cost of the book as a percentage of the original price?

10. 209 liters of water is poured into containers A, B, and C. B contains 50% more water than A and C contains 50% more water than B. How many liters of water is in B?

11. If 3% of half a number is 12, what is the number?

12. Suppose 15% of  $a$  equals 20% of  $b$ . What percentage of  $a$  is  $b$ ?