

What you will learn about:
Problem-Solving Strategy

Use a Problem-Solving Strategy to solve word problems

Step 1. **Read** the problem. Make sure all the words and ideas are understood.

Step 2. **Identify** what we are looking for.

Step 3. **Name** what we are looking for. Choose a variable to represent that quantity.

Step 4. **Translate** into an equation. It may be helpful to restate the problem in one sentence with all the important information. Then, translate the English sentence into an algebraic equation.

Step 5. **Solve** the equation using good algebra techniques.

Step 6. **Check** the answer in the problem and make sure it makes sense.

Step 7. **Answer** the question with a complete sentence.

Pilar bought a purse on sale for \$18, which is one-half the original price. What was the original price of the purse?

Joaquin bought a bookcase on sale for \$120, which was two-thirds of the original price. What was the original price of the bookcase?

Gerry worked Sudoku puzzles and crossword puzzles this week. The number of Sudoku puzzles he completed is eight more than twice the number of crossword puzzles. He completed 22 Sudoku puzzles. How many total puzzles did he do?

Solving number problems

The difference of a number and six is 13. Find the number.

The sum of twice a number and seven is 15. Find the number.

One number is five more than another. The sum of the numbers is 21. Find the numbers.

One number is six more than another. The sum of the numbers is twenty-four. Find the numbers.

The sum of two numbers is -18. One number is 40 more than the other. Find the numbers.

One number is three more than three times another. The sum is -5. Find the numbers.

The sum of two consecutive integers is 47. Find the numbers.

The sum of two consecutive integers is 95. Find the numbers.

Find three consecutive integers whose sum is -42.

Find three consecutive integers whose sum is -96.

Find three consecutive even integers whose sum is 84.

Find three consecutive even integers whose sum is 102.

A married couple together earns \$110,000 a year. The wife earns \$16,000 less than twice what her husband earns. What does the husband earn?

According to the National Automobile Dealers Association, the average cost of a car in 2014 was \$28,500. This was \$1,500 less than 6 times the cost in 1975. What was the average cost of a car in 1975?

What you will learn about:
Percent Problems

Translate and solve: What number is 35% of 90?

Translate and solve: What number is 45% of 80?

Translate and solve: 6.5% of what number is \$1.17?

Translate and solve: 7.5% of what number is \$1.95?

Translate and solve: 144 is what percent of 96?

Translate and solve: 126 is what percent of 72?

Use problem-solving strategies to solve an application

Step1. **Read** the problem. Make sure all the words and ideas are understood.

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Step 5. **Solve** the equation using good algebra techniques.

Step 6. **Check** the answer in the problem and make sure it makes sense.

Step 7. **Answer** the question with a complete sentence.

Paul and his girlfriend enjoyed a nice dinner at a restaurant and his bill was \$68.50. He wants to leave an 18% tip. If the tip will be 18% of the total bill, how much tip should he leave?

Shelly had lunch at her favorite restaurant. She wants to leave 15% of the total bill as her tip. If her bill was \$14.40, how much will she leave of the tip?

One serving of wheat square cereal has seven grams of fiber, which is 28% of the recommended daily amount. What is the total recommended daily amount of fiber?

The label on George's breakfast cereal said that one serving of cereal provides 85 mg of potassium, which is 2% of the recommended daily amount. What is the total recommended daily amount of potassium?

<p>Find the percent of increase</p>	<p>Tammy received some gourmet brownies as a gift. The wrapper said each brownie was 480 calories, and had 240 calories of fat. What percent of the total calories in each brownie comes from fat?</p> <p>Round to the nearest whole percent. Veronica is planning to make muffins from a mix. The package says each muffin will be 230 calories and 60 calories will be from fat. What percent of the total calories come from fat?</p> <p>Step 1. Find the amount of increase. $\text{new amount} - \text{original amount} = \text{increase}$</p> <p>Step 2. Find the percent increase. The increase is what percent of the original amount?</p> <p>In 2011, the California governor proposed raising community college fees from \$26 a unit to \$36 a unit. Find the percent increase. (Round to the nearest tenth of a percent.)</p> <p>In 2011, the IRS increased the deductible mileage cost to 55.5 cents from 51 cents. To the nearest percent, find the percent increase.</p> <p>Find the percent increase. In 1995, the standard bus fare in Chicago was \$1.50. In 2008, the standard bus fare was \$2.25</p>
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<p>Find the Percent Decrease</p>	<p>Step 1. Find the amount of decrease $original\ amount - new\ amount = decrease$</p> <p>Step 2. Find the percent of decrease. Decrease is what percent of the original amount?</p> <p>The average price of a gallon of gas in one city in June 2014 was \$3.71 The average price in that city in July was \$3.64. Find the percnet of decrease.</p> <p>Find the percent decrease. Last year, Sheila’s salary was \$42,000. Because of furlough days, this year, her salary was \$37,800.</p>
<p>Simple Interest</p> <p>$I = Prt$</p> <p>$I =$</p> <p>$P =$</p> <p>$r =$</p> <p>$t =$</p>	<p>Nathan dposited \$12,500 in his bank account where it will earn 4% interest. How much will Nathan earn in 5 years?</p> <p>Mary invested a principle of \$950 in her bank account with interest at 3%. How much interest did she earn in 5 years?</p> <p>Loren loaned his brother \$3,000 to help him buy a car. In 4 years his brother paid him back the \$3,000 plus \$660 in interest. What was the rate if interest?</p>

<p>Solve application with discount or mark up</p>	<p>Jim loaned \$5,000 to his sister to help her buy a house. In 3 years, she paid him \$5000, plus \$900 in interest. What was the rate of interest?</p> <p>Eduardo noticed that his new car loan papers stated that with a 7.5% interest rate, he would pay \$6,596.25 in interest over 5 years. How much did he borrow to pay for his car?</p> <p>Amount of discount = (discount Rate)(original price) Sale price = original price – amount of discount</p> <p>Elise bought a dress that was discounted 35% off of the original price of \$140. What was A) the amount of discount and B) the sale price of the dress?</p> <p>Find A) the amount of discount and B) the sale price: Sergio bought a belt that was discounted 40% from an original price of \$29.</p> <p>Jeannette bought a swimsuit at a sale price of \$13.95. The original price of the swimsuit was \$31. Find the amount of discount and B) the discount rate.</p>
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Mark-up

Amount of mark-up = (mark-up)(original cost)

List price = original cost + amount of mark up

Adam's art gallery bought a photograph at original cost \$250. Adam marked the price up 40%. Find the amount of mark up and the list price of the photgraph.

Find the amount of mark-up and the list price. Jim's music store bought a guitar at original cost \$1,200. Jim marked the price up 30%.

Find the amount of mark-up and the list price. The Auto Resale bought Palbo's Toyota for \$8,500. The marked the price up 35%.

Jarod bought a shirt for \$18. He had to pay 6.5% in saies tax. What was the total price of the shirt?

What you will learn about:
Solve Mixture Application

Alberto has \$2.25 in dimes and nickels in his pocket. He has nine more nickels than dimes. How many of each type of coins does he have?

Type	<i>Number · Value(\$)</i> = <i>Total Value(\$)</i>		
Dimes			
Nickels			
			\$2.25

Michaela has \$2.05 in dimes and nickels in her change purse. She has seven more dimes than nickels. How many of each type does she have?

Maria has \$2.43 in quarters and pennies in her wallet. She has twice as many pennies as quarters. How many of coins of each type does she have?

At a school concert, the total value of tickets sold was \$1,506. Student tickets sold for \$6 and each adult ticket sold for \$9 each. The number of adult tickets sold was five less than three times the number of student tickets sold. How many student tickets and how many adult tickets were sold?

Type	<i>Number · Value(\$)</i> = <i>Total Value(\$)</i>		
Student			
Adult			
			\$1506

A whale-watching ship had 40 paying passengers on board. The total collection from tickets was \$1,196. Full-fare passenger paid \$32 each and reduced-fare passenger paid \$26 each. How many full-fare passengers and how many reduced-rate fare passengers were on the ship?

Henning is mixing raisins and nuts to make 10 pounds of trail mix. Raisins cost \$2 a pound and nuts cost \$6 a pound. If Henning wants his cost of the trail mix to be \$5.20 a pound, how many pounds of raisins and how many pounds of nuts should he use?

Type	pounds	Price per pound	total value
Trail mix	10	5.20	10(5.20)

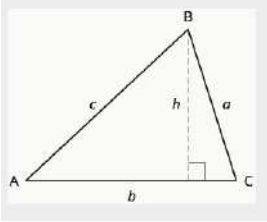
Becca wants to make mix juice and soda punch. She can buy fruit juice for \$3 a gallon and soda for \$4 a gallon. If she wants to make 28 gallons of punch at a cost of \$3.25 a gallon, how many gallons of fruit juice and how many gallons of soda should she buy?

Stacey has \$20,000 to invest in two different bank accounts. One account pays interest at 3% per year and the other account pays 5% per year. How much should she invest in each account if she want to earn 4.5% interest per year on the total amount?

Marco has \$8000 to save or his daughter's college education. He wants to divide it between one account that pays 3.2% interest and the other account pays 8% interest per year. How much should he invest in each account if he wants the interest on the total investment to be 6.5%.

What you will learn about:
Solving Geometric Applications:
Triangles, Rectangles, Pythagorean Theorem

Triangle Property



Angle Measure:

Perimeter:

Area:

Right Triangle

Measure of two angles of a triangle are 55 and 82 degrees. Find the measure of the third angle.

The perimeter of a triangular garden is 24 feet. The lengths of two sides are four feet and nine feet. How long is the third side?

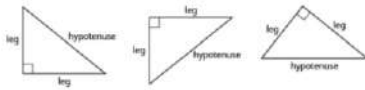
The area of a triangular church window is 90 square meters. The base of the window is 15 meters. What is the new window's height?

One angle of a right triangle is 28° . What is the measure of the third angle?

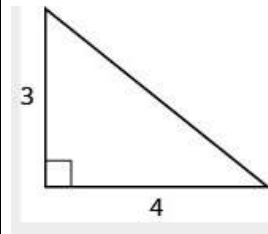
The measure of one angle of a right triangle is 20 degrees more than the measure of the smallest angle. Find the measure of all three angles.

Pythagorean Theorem

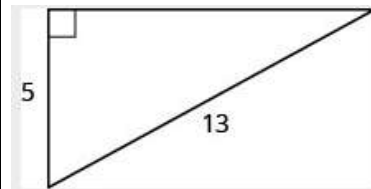
each of the other sides are called legs



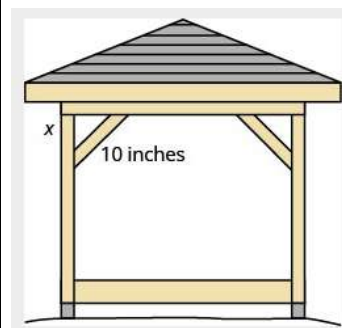
Use the Pythagorean Theorem to find the length of the hypotenuse shown below.



Use the Pythagorean Theorem to find the length of the leg shown below.



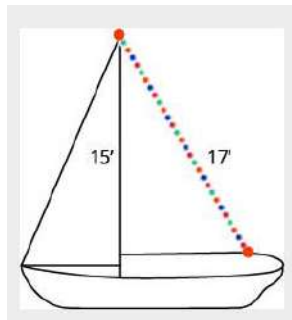
Kelvin is building a gazebo and wants to brace each corner by placing 10" piece of wood diagonally as shown above. If he fastens the wood so that the ends of the brace are the same distance from the corner, what is the length of the legs of the right triangle formed? Approximate to the nearest tenth of an inch.



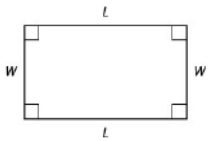
John puts the base of a 13-foot ladder five feet from the wall of his house as shown below. How far up the wall does the ladder reach?



Randy want to attach a 17 foot string of lights to the top of the 15 foot mast of his sailboat, as shown below. How far from the base of the mast should he attach the end of the string?



Rectangles



Properties

Perimeter

Area

The length of a rectangle is 32 meters and the width is 20 meters. What is the perimeter.

The area of a rectangular room is 168 square feet. The length is 14 feet. What is the width?

Find the length of a rectangle with perimeter of 50 inches and width 10 inches.

The width of a rectangle is two feet less than the length. The perimeter is 52 feet. Find the length and width.

The width of a rectangle is seven meters less than the length. The perimeter is 58 meters. Find the length and width.

The perimeter of a rectangular swimming pool is 200 feet. The length is 40 feet more than the width. Find the length and width.

The perimeter of the TV screen is 150 inches. The length is six less than 2 times the width. Find the length and width. What is the size of the TV. (TV's are measured by the length of the diagonal of the screen.)

What you will learn about:
Uniform Motion

An express train and a local train leave Pittsburgh to travel to Washington D.C. the express train and make the trip in 4 hours and the local train takes 5 hours for the trip. The speed of the express train is 12 miles per hour faster than the speed of the local train. Find the speed of both trains.

	Rate	· Time	= Distance

Wayne and Dennis like to ride the bike path from Riverside Park to the beach. Dennis's speed is seven miles per hour faster than Wayne's speed, so it takes Wayne 2 hours to ride to the beach while it takes Dennis 1.5 hours for the ride. Find the speed of both bikes.

	Rate	· Time	= Distance

Jeremy can drive from his house in Cleveland to his college in Chicago in 4.5 hours. It takes his mother 6 hours to make the same drive. Jeremy drives 20 miles per hour faster than his mother. Find Jeremy's speed and his mother's speed.

Chris and his parents live 115 miles apart. They met at a restaurant between their homes to celebrate his mother's birthday. Chris drive 1.5 hours while his parents drove 1 hour to get to the restaurant. Chris's average speed was 10 miles per hour faster than his parents' average speed. What were the average speeds of Chris and of his parents as they drove to the restaurant?

	Rate	· Time	= Distance

Carrie is driving from her home in Anaheim to Berkeley on the same day her brother is driving from Berkeley to Anaheim, so they decide to meet for lunch along the way in Buttonwillow. The distance from Anaheim to Berkeley is 410 miles. It takes Carrie 3 hours to get to Buttonwillow, while her brother drives 4 hours to get there. The average speed Carrie's brother drove was 15 miles per hour faster than Carrie's average speed. Find Carrie's and her brother's average speed.

When Katie walks to school, it takes her 30 minutes. If she rides her bike, it takes her 15 minutes. Her speed is three miles per hour faster when she rides her bike than when she walks. What are her walking speed and her speed riding her bike?

Ryan takes 45 minutes to drive his boat upstream from the dock to his favorite fishing spot. It takes him 30 minutes to drive the boat back downstream to the dock. The boat's speed going downstream is four miles per hour faster than its speed going upstream. Find the boat's upstream and downstream speeds.

Suzy takes 50 minutes to hike uphill from the parking lot to the lookout tower. It takes her 30 minutes to hike back down to the parking lot. Her speed going downhill is 1.2 miles per hour faster than her speed going uphill. Find Suzy's uphill and downhill speeds.

What you will learn about:
Application with Linear
Inequalities

Emma got a new job and will have to move. Her monthly income will be \$5,265. To qualify to rent an apartment, Emma's monthly income must be at least three times as much as the rent. What is the highest rent Emma will qualify for?

Alan is loading a pallet with boxes that each weighs 45 pounds. The pallet can safely support no more than 900 pounds. How many boxes can he safely load onto the pallet?

Dawn won a mini-grant of \$4000 to buy tablet computers for her classroom. The tablets she would like to buy cost \$254.12 each, including tax and delivery. What is the maximum number of tablets Dawn can buy?

Pete works at a computer store. His weekly pay will be either a fixed amount, \$925, or \$500 plus 12% of his total sales. How much should his total sales be for his variable pay option to exceed the fixed amount of \$925?

Sergio and Liz have a very tight vacation budget. They plan to rent a car from a company that charges \$75 a week plus \$0.25 a mile. How many miles can they travel and still keep within their \$200 budget?

Elliot has a landscape maintenance business. His monthly expenses are \$1,100. If he charges \$60 per job, how many jobs must he do to earn a profit of at least \$4,000 a month?

Brenda's best friend is having a destination wedding and the event will last 3 days. Brenda has \$500 in savings and can earn \$15 an hour babysitting. She expects to pay \$350 airfare, \$375 for food and entertainment and \$60 a night for her share of a hotel room. How many hours must she babysit to have enough money to pay for the trip?