Word Problems (involving linear equations)

"Age" Word Problems

1) One-half of Heather's age two years from now plus one-third of her age three years ago is twenty years. How old is she now?

Geometry Word Problems

1) Suppose a water tank in the shape of a right circular cylinder is thirty feet long and eight feet in diameter. How much sheet metal was used in its construction?

2) A piece of 16-gauge copper wire 42 cm long is bent into the shape of a rectangle whose width is twice its length. Find the dimensions of the rectangle.

"Coin" Word Problems

1) A collection of 33 coins, consisting of nickels, dimes, and quarters, has a value of $3.30. If there are three times as many nickels as quarters, and one-half as many dimes as nickels, how many coins of each kind are there?

2) A wallet contains the same number of pennies, nickels, and dimes. The coins total $1.44. How many of each type of coin does the wallet contain?

"Distance" Word Problems

1) An aircraft carrier made a trip to Guam and back. The trip there took three hours and the trip back took four hours. It averaged 6 km/h on the return trip. Find the average speed of the trip there.

2) A passenger plane made a trip to Las Vegas and back. On the trip there it flew 432 mph and on the return trip it went 480 mph. How long did the trip there take if the return trip took nine hours?

3) A cattle train left Miami and traveled toward New York. 14 hours later a diesel train left traveling at 45 km/h in an effort to catch up to the cattle train. After traveling for four hours the diesel train finally caught up. What was the cattle train's average speed?

4) Jose left the White House and drove toward the recycling plant at an average speed of 40 km/h. Rob left some time later driving in the same direction at an average speed of 48 km/h. After driving for five hours Rob caught up with Jose. How long did Jose drive before Rob caught up?

5) A passenger train leaves the train depot 2 hours after a freight train left the same depot. The freight train is traveling 20 mph slower than the passenger train. Find the rate of each train, if the passenger train overtakes the freight train in three hours.

6) Two cyclists start at the same time from opposite ends of a course that is 45 miles long. One cyclist is riding at 14 mph and the second cyclist is riding at 16 mph. How long after they begin will they meet?

= Problems to try for homework

7) A boat travels for three hours with a current of 3 mph and then returns the same distance against the current in four hours. What is the boat's speed in calm water? How far did the boat travel one way?

8) With the wind, an airplane travels 1120 miles in seven hours. Against the wind, it takes eight hours. Find the rate of the plane in still air and the velocity of the wind.

9) A spike is hammered into a train rail. You are standing at the other end of the rail. You hear the sound of the hammer strike both through the air and through the rail itself. These sounds arrive at your point six seconds apart. You know that sound travels through air at 1100 feet per second and through steel at $16{,}500$ feet per second. How far away is that spike?

"Investment" Word Problems *(simple interest)*

1) You put $\$1000$ into an investment yielding 6% annual interest; you left the money in for two years. How much interest do you get at the end of those two years?

2) You invested $500 and received $650 after three years. What had been the interest rate?

3) You have $\$50{,}000$ to invest, and two funds that you'd like to invest in. The You-Risk-It Fund (Fund Y) yields 14% interest. The Extra-Dull Fund (Fund X) yields 6% interest. Because of college financial-aid implications, you don't think you can afford to earn more than $\$4{,}500$ in interest income this year. How much should you put in each fund?"

4) An investment of $\$3{,}000$ is made at an annual simple interest rate of 5%. How much additional money must be invested at an annual simple interest rate of 9% so that the total annual interest earned is 7.5% of the total investment?

5) A total of $\$6{,}000$ is invested into two simple interest accounts. The annual simple interest rate on one account is 9%; on the second account, the annual simple interest rate is 6%. How much should be invested in each account so that both accounts earn the same amount of annual interest?

6) An investor deposited an amount of money into a high-yield mutual fund that returns a 9% annual simple interest rate. A second deposit, $\$2{,}500$ more than the first, was placed in a certificate of deposit that returns a 5% annual simple interest rate. The total interest earned on both investments for one year was $\$475$. How much money was deposited in the mutual fund?

7) The manager of a mutual fund placed 30% of the fund's available cash in a 6% simple interest account, 25% in 8% corporate bonds, and the remainder in a money market fund that earns 7.5% annual simple interest. The total annual interest from the investments was $\$35{,}875$. What was the total amount invested?

"Number" Word Problems

1) The sum of two consecutive integers is 15. Find the numbers.

2) The product of two consecutive negative even integers is 24. Find the numbers.

= Problems to try for homework

3) Twice the larger of two numbers is three more than five times the smaller, and the sum of four times the larger and three times the smaller is 71. What are the numbers?

"Percent of" Word Problems

1) A golf shop pays its wholesaler $40 for a certain club, and then sells it to a golfer for$75. What is the markup rate?

2) A shoe store uses a 40% markup on cost. Find the cost of a pair of shoes that sells for$63.

3) An item originally priced at $55 is marked 25% off. What is the sale price?

4) An item that regularly sells for $425 is marked down to $318.75. What is the discount rate?

5) An item is marked down 15%; the sale price is $127.46. What was the original price?

Mixture Word Problems

1) 2 m³ of soil containing 35% sand was mixed into 6 m³ of soil containing 15% sand. What is the sand content of the mixture?

2) 9 lbs. of mixed nuts containing 55% peanuts were mixed with 6 lbs. of another kind of mixed nuts that contain 40% peanuts. What percent of the new mixture is peanuts?

3) 5 fl. oz. of a 2% alcohol solution was mixed with 11 fl. oz. of a 66% alcohol solution. Find the concentration of the new mixture.

4) 16 lb of Brand M Cinnamon was made by combining 12 lb of Indonesian cinnamon which costs $19/lb with 4 lb of Thai cinnamon which costs $11/lb. Find the cost per lb of the mixture.

Work Word Problems

1) Working alone, Ryan can dig a 10 ft by 10 ft hole in five hours. Castel can dig the same hole in six hours. How long would it take them if they worked together?

2) Shawna can pour a large concrete driveway in six hours. Dan can pour the same driveway in seven hours. Find how long it would take them if they worked together.

3) It takes Trevon ten hours to clean an attic. Cody can clean the same attic in seven hours. Find how long it would take them if they worked together.

4) Working alone, Carlos can oil the lanes in a bowling alley in five hours. Jenny can oil the same lanes in nine hours. If they worked together how long would it take them?

5) Working together, Paul and Daniel can pick forty bushels of apples in 4.95 hours. Had he done it alone it would have taken Daniel 9 hours. Find how long it would take Paul to do it alone.

6) Working together, Jenny and Natalie can mop a warehouse in 5.14 hours. Had she done it alone it would have taken Natalie 12 hours. How long would it take Jenny to do it alone?

= Problems to try for homework