

Linear Equation Word Problems

HOW TO SOLVE WORD PROBLEMS

Read each question carefully. Re-read each question carefully.

Underline the numbers. Underline the question.

Define the variable.

Write the equation.

Solve the equation.

Check your answer **with the original word problem.**

1. A secret number plus 9 equals 15. What is the secret number?
2. I have a secret number. I multiply it by 2 and then add 8. The answer is 26. What was my secret number?
3. I have a secret number. I add 4. I multiply the result by 3. The final answer is 27. What was the secret number?

Linear Equations - Word Problems

Budding Genius!

1. I have a secret number. I add 5 to this number. The answer is 12. What is my secret number?
 - a. Define the variable.
.....
 - b. Write the equation
 - c. Solve the equation (use your favorite method)
 - d. Check your solution.

2. I have a secret number. I multiply it by 3. The answer is 15. What is my secret number?
 - a. Define the variable.
.....
 - b. Write the equation
 - c. Solve the equation (use your favorite method)
 - d. Check your solution.

Genius!

3. I have a secret number. I multiply it by 4. I then subtract 3. The answer is 21. What is my secret number?
 - a. Define the variable.
.....
 - b. Write the equation
 - c. Solve the equation (use your favorite method)
 - d. Check your solution.

4. A taxi company charges \$2 per mile. How far did I travel if it cost me \$30?
 - a. Define the variable.
.....
 - b. Write the equation
 - c. Solve the equation (use your favorite method)
 - d. Check your solution.

Super Genius!

5. My mobile phone costs me 50 cents per minute. My last phone call cost me \$4. How many minutes did I talk?
- a. Define the variable.
.....
- b. Write the equation
- c. Solve the equation (use your favorite method) d. Check your solution.
-
6. The instructions for cooking a roast are "30 minutes per kilogram plus 20 minutes extra". I cooked my roast for 170 minutes. How much did it weigh?
- a. Define the variable.
.....
- b. Write the equation
- c. Solve the equation (use your favorite method) d. Check your solution.

Mega Genius Challenge Questions!

7. I have a secret number. I add 4 and then double it. Then I take off 6. The result is 18. What is my secret number?
- a. Define the variable.
.....
- b. Write the equation
- c. Solve the equation (use your favorite method) d. Check your solution.
-
8. An elephant, a giraffe and a hippopotamus all climbed together onto a scale. Together they weighed 3675 kilograms. If the giraffe weighed 600 kg, and the elephant weighed twice as much as the hippopotamus, how much did the elephant weigh?
- a. Define the variables.
.....
- b. Write the equation
- c. Solve the equation (use your favorite method) d. Check your solution.

Linear Equations - Word Problems

Write the equation for each of these problems. Then solve the equation.

1. I have a secret number. I add 5 to this number. The answer is -2. What is my secret number?
2. A number, plus 1 more than the number, plus 2 more than the number, adds to 10. What is the number?
3. The cost in dollars of producing n CDs is given by the formula $C = 1.5n + 300$. If the cost last week was \$480, how many CDs were produced?
4. An elephant, a giraffe and a hippopotamus all climbed together onto a scale. Together they weighed 3675 kilograms. If the giraffe weighed 600 kg, and the elephant weighed twice as much as the hippopotamus, how much did the elephant weigh?
5. I square a number, then subtract 20. The answer is 101. What was the number?
6. The formula for the cost of assembling n computers is given by $C = 40n + 500$.
 - a. How much does it cost to assemble 30 computers?
 - b. Make n the subject.
 - c. How many computers were constructed if the cost was \$1580?
7. I think of a number. I double it, add 3 and then double the result. The final result is 36. What is the number?
8. A rectangle has a perimeter of 36 m. Its length is 3 times its width. What is its length and width?
9. Joshua weighs twice as much as Angela. Their average weight is 72 kilograms. How much does each weigh?
10. A pizza and a coke together cost \$11. The pizza cost \$10 more than the coke. How much did the pizza cost?

Linear Equation Word Problems

For each question below:

Define the variable(s)

Write the equation.

Solve the equation.

Check your answer **with the original word problem.**

What you don't finish in class is to be completed for homework. Set out your work (see above)..

1. I have a secret number. I multiply it by 4 and then add 3. The answer is 51. What was my secret number?
2. A number, plus 1 more than the number, plus 2 more than the number, adds to 30. What is the number?
3. A rectangle has a perimeter of 64 m. Its length is 3 times its width. What is its length and width?

Challenge

4. I square a number, then subtract 20. The answer is 101. What was the number?
5. A pizza and a coke together cost \$11. The pizza cost \$10 more than the coke. How much did the pizza cost?
6. The sum of three consecutive odd numbers is 51. What are the three numbers?

Mega-Challenge

Problem 24, from the 'Rhind Papyrus' from the Middle Kingdom, c. 1850 B.C.

7. A quantity and its seventh added together become 19: what is the quantity?

Linear Equation Word Problems

HOW TO SOLVE WORD PROBLEMS

Read each question carefully.

Define the variable(s).

Write the equation.

Solve the equation.

Check your answer **with the original word problem.**

1. A secret number plus 9 equals 15. What is the secret number?
2. I have a secret number. I multiply it by 2 and then add 8. The answer is 26. What was my secret number?
3. I have a secret number. I add 4. I multiply the result by 3. The final answer is 27. What was the secret number?
4. I have a secret number. I add 5 to this number. The answer is -2. What is my secret number?
5. A number, plus 1 more than the number, plus 2 more than the number, adds to 10. What is the number?
6. An elephant, a giraffe and a hippopotamus all climbed together onto a scale. Together they weighed 3675 kilograms. If the giraffe weighed 600 kg, and the elephant weighed twice as much as the hippopotamus, how much did the elephant weigh?
7. I square a number, then subtract 20. The answer is 101. What was the number?
8. I think of a number. I double it, add 3 and then double the result. The final result is 36. What is the number?
9. A rectangle has a perimeter of 36 m. Its length is 3 times its width. What is its length and width?
10. Joshua weighs twice as much as Angela. Their average weight is 72 kilograms. How much does each weigh?
11. A pizza and a coke together cost \$11. The pizza cost \$10 more than the coke. How much did the pizza cost?
12. The formula for converting degrees Fahrenheit to degrees Celsius is $C = \frac{5}{9}(F - 32)$. Find the temperature in degrees Fahrenheit if the Celsius temperature is $25^{\circ}C$.

13. The sum of three consecutive numbers is 36. Find the three numbers.
14. The sum of three consecutive odd numbers is 51. Use an equation to find the three numbers.

Challenge Questions

15. Sarah has twice as much money as Julie. Julie has \$9 more than Sam. Altogether they have \$77. How much does each have?
16. Darryl has twice as many books as Lorraine. Lorraine has 3 more books than Kristie. Kristie has one more book than Zane. Altogether they have 68 books. How many books does each student have?
17. I have three times as many 20c coins as 50c coins. The total value of these coins is \$16.50. How many coins of each type do I have?
18. A mother's age is twice her son's age now. In 5 years time (5 years from today), the sum of the mother's age and the son's age will be equal to twice the mother's age 5 years ago (5 years before today). Write an equation and solve it to find the ages of the mother and her son today.

Ancient Equations

Problem 24, from the 'Rhind Papyrus' from the Middle Kingdom, c. 1850 B.C.

19. A quantity and its seventh added together become 19: what is the quantity?

Problem number 6, from the 'Moscow Papyrus' from the Middle Kingdom of Egypt, 2700-1670 B.C.

20. A rectangle has area 12 square units: its breadth is three-quarters of its length: find both breadth and length.

From the Ahmes Papyrus, Problem 21

21. Complete $\frac{2}{3}$ and $\frac{1}{15}$ to 1. In modern terms, this asks for a fraction x such that: $\frac{2}{3} + \frac{1}{15} + x = 1$.

From the Ahmes Papyrus, Problem 24

22. A quantity added to a quarter of that quantity become 15. What is the quantity?

From Babylonian clay tablets, c. 1750 B.C.

23. I found a stone but did not weigh it; after I subtracted one-seventh of it, and then took one-thirteenth of what I still had, the result was 1 unit: what was the original weight?

Linear Equations - Word Problems

1. I have a secret number. I add 5 to this number. The answer is -2. What is my secret number?
 - a. Define the variable.
 - b. Write the equation
 - c. Solve the equation
 - d. Check your solution.

.....

.....

.....

.....

.....

2. A taxi company charges \$3 plus \$2 per mile. How far did I travel if it cost me \$27?
 - a. Define the variable.
 - b. Write the equation
 - c. Solve the equation
 - d. Check your solution.

.....

.....

.....

.....

.....

3. My mobile phone plan costs me \$20 plus \$0.08 per minute. Last month it cost me \$40 altogether. How many minutes did I talk?
 - a. Define the variable.
 - b. Write the equation
 - c. Solve the equation
 - d. Check your solution.

.....

.....

.....

.....

.....

DO THESE QUESTIONS IN YOUR EXERCISE BOOK!

4. The cost in dollars of producing n CDs is given by the formula $C = 1.5n + 300$. If the cost last week was \$480, how many CDs were produced? Set out your work.

5. The formula for the cost of assembling n computers is given by $C = 40n + 500$.
 - a. How much does it cost to assemble 30 computers?
 - b. How many computers were constructed if the cost was \$1580?

Challenge! Define the variable. Write the equation. Simplify and solve.

6. I think of a number. I double it, add 3 and then double the result. The final result is 36. What is the number?

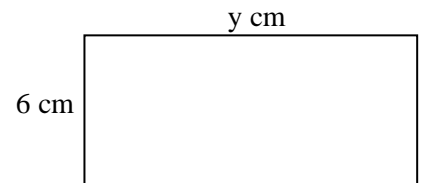
7. An elephant, a giraffe and a hippopotamus all climbed together onto a scale. Together they weighed 3675 kilograms. If the giraffe weighed 600 kg, and the elephant weighed twice as much as the hippopotamus, how much did the elephant weigh?

Linear Equation Word Problems

- I think of a number, double it, and then add 4. The result is 32. Find the original number, as follows:
 - Define the variable (e.g. Let $x = \dots$)
 - Write an equation from the information given.
 - Solve the equation to find the original number.
 - Check your solution against the original word problem.

- I think of a number, add 4, and then double the answer. The result is 4. Find the original number, as follows:
 - Define the variable (e.g. Let $x = \dots$)
 - Write an equation from the information given.
 - Solve the equation.
 - Check your solution against the original word problem.

- The perimeter of the rectangle alongside is 38 cm. Find the unknown length, as follows:
 - Define the variable (e.g. Let $y = \dots$)
 - Write the equation from the information given
 - Solve the equation to find the value of y .
 - Check your solution against the original word problem.



- A circle has a circumference of 37.68 metres. The formula for circumference of a circle is $C = \pi D$. Find the diameter of the circle, as follows:
 - Define the variable (e.g. Let $D = \dots$)
 - Write the equation to find the diameter.
 - Solve the equation for D .
 - Check your solution against the original word problem.

For questions 5 to 12:

- Define the variable.
 - Write the equation.
 - Solve the equation.
 - Check your solution against the original word problem.
- A number, plus 1 more than the number, plus 2 more than the number, adds to 10. What is the number?
 - The cost in dollars of producing n CDs is given by the formula $C = 1.5n + 300$. If the cost last week was \$480, how many CDs were produced?
 - An elephant, a giraffe and a hippopotamus all climbed together onto a scale. Together they weighed 3675 kilograms. If the giraffe weighed 600 kg, and the elephant weighed twice as much as the hippopotamus, how much did the elephant weigh?
 - I square a number, then subtract 20. The answer is 101. What was the number?
 - I think of a number, double it, add 3 and then double the result. The final result is 36. What is the number?
 - A rectangle has a perimeter of 36 m. Its length is 3 times its width. What is its length and width?
 - Joshua weighs twice as much as Angela. Their average weight is 72 kilograms. How much does each weigh?
 - A pizza and a coke together cost \$11. The pizza cost \$10 more than the coke. How much did the pizza cost?
 - The formula for the cost C of assembling n computers is $C = 40n + 500$.
 - How much does it cost to assemble 30 computers?
 - Make n the subject.
 - Use this new formula to calculate how many computers were constructed if the cost was \$1580.

Linear Equations - Word Problems

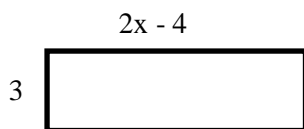
1. The formula for finding the area of a triangle is $A = \frac{B \times H}{2}$, where A = the area of the triangle, B = length of the base, and H = perpendicular height.
 - a. Find the area of a triangle with a base of 12 cm and a perpendicular height of 6 cm.
 - b. Find the perpendicular height of a triangle if the area is 50 cm^2 and the base is 20 cm.
 - c. Find the base if the area is 50 cm^2 and the perpendicular height is 8 cm.

2. The formula for the perimeter of a rectangle is $P = 2(L + B)$, where P = perimeter of the rectangle, L = the length and B = the breadth.
 - a. Find the perimeter of the rectangle if $L = 6 \text{ cm}$ and $B = 4.5 \text{ cm}$.
 - b. Find the length of the rectangle if the perimeter = 45 cm and the breadth = 12 cm.
 - c. Find the breadth of the rectangle if the perimeter = 36 cm and the length = 11 cm.

3. The formula for converting degrees Fahrenheit to degrees Celsius is $C = \frac{5}{9}(F - 32)$. Find the temperature in degrees Fahrenheit if the Celsius temperature is 25° C .
 - c. The sum of three consecutive odd numbers is 51. Use an equation to find the three numbers.
 - d. Sarah has twice as much money as Julie. Julie has \$9 more than Sam. Altogether they have \$77. How much does each have?
 - e. I have three times as many 20c coins as 50c coins. The total value of these coins is \$16.50. How many coins of each type do I have?

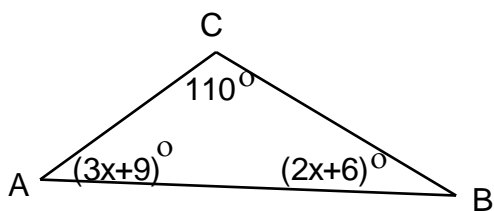
A mother's age is twice her son's age now. In 5 years time (5 years from today), the sum of the mother's age and the son's age will be equal to twice the mother's age 5 years ago (5 years before today). Write an equation and solve it to find the ages of the mother and her son today.

a.



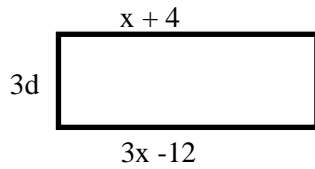
If the perimeter of the rectangle is 35 cm, find x .

b.



Find the two unknown angles, A & B. (not just x).

5. a.



The figure at the left is a rectangle.
Use your knowledge of rectangles to solve for x .
Hence find the area of the rectangle.

b. The sum of three consecutive numbers is 36. *Use an equation* to find the three numbers.
(6 marks)

2. Darryl has twice as many books as Lorraine. Lorraine has 3 more books than Kristie. Kristie has one more book than Zane. Altogether they have 68 books. How many books does each student have?