

Notes 16Y Equations

When solving an equation, you must first determine the operation operation.
 Then, apply the inverse operation inverse operation to both sides of the equation (to keep it balanced).
 Lastly, substitution substitution check check your solution back into the equation to check your work.

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$$\begin{array}{r} x + 2.3 = 7.6 \\ - 2.3 \quad - 2.3 \\ \hline x = 5.3 \end{array}$$

Check:
 $5.3 + 2.3 = 7.6 \checkmark$

-

$$\begin{array}{r} m - 17 = 48 \\ + 17 \quad + 17 \\ \hline m = 65 \end{array}$$

Check:
 $65 - 17 = 48 \checkmark$

Solving Equations

x

$$\frac{14w}{14} = \frac{154}{14}$$

$w = 11$

$$\begin{array}{r} 11 \overline{) 154} \\ \underline{110} \\ 44 \\ \underline{44} \\ 0 \end{array}$$

Check:

$$\begin{array}{r} 11 \\ 11 \overline{) 154} \\ \underline{110} \\ 44 \\ \underline{44} \\ 0 \end{array} \checkmark$$

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$$6x \cdot \frac{9}{8} = 32 \cdot 8$$

$$\begin{array}{r} 32 \\ \times 8 \\ \hline 256 \end{array}$$

Check: $8 \overline{) 256}$

$$\begin{array}{r} 32 \\ 8 \overline{) 256} \\ \underline{240} \\ 16 \\ \underline{16} \\ 0 \end{array} \checkmark$$

Notes Writing Equations

Why do I need to know how to WRITE an equation?

Because in the real world, no one is going to hand me an equation and say, "Solve this!" Instead, I will be in situations where I will have to solve a real problem, and I'll have to really figure it out on my own! Figuring out the equation is the first step in solving such a problem.



Example 1: Morgan spent \$54.38 on three pairs of jeans. If each pair of jeans costs the same amount, write an algebraic equation that represents this situation and solve to determine how much one pair of jeans cost.

Model with a tape diagram:

\$54.38		
1	1	1

Each "1" is the same size because the jeans cost the same amount. Three "1's" equal the total. So, our equation is $3j = \$54.38$

Example 2: Julia gets paid \$20 for babysitting. She spends \$2.99 on a package of trading cards and \$4.50 on lunch. Write and solve an equation to show how much money Julia has left.

Model with a tape diagram:

\$20		
1	4.50	Money left over (m)

This equation is $1 + 4.50 + m = 20$

KEY words and phrases: Use under-ly words and phrases that indicate what operation or symbol to put in your equation. Some are already listed for you!

word	symbol	word	symbol	word	symbol
altogether	+	less than	-	groups of	×
sum	+	minus	-	times	×
add	+	or	-	part	÷
combine	+	difference	-	quotient	÷
increase by	+	equivalent to	=	is	=
more than	+				

Additional Examples

- 1) the sum of 39 and n is 87 $39 + n = 87$ 2) four groups of a number is 40 $4g = 40$ 3) half of n is equivalent to 40 $\frac{n}{2} = 40$ OR $n/2 = 40$

Notes Writing Expressions with Variables

★ TIP: ALWAYS remember that the VARIABLE represents a NUMBER!!! ★

(1) Bryce earns \$25 for every hour she works on the weekends. Write an expression to represent the total amount of money she makes.

25h or 25(1)
h = hours she works
25 = \$

(2) DeAndre is 8 years younger than his sister, Alyah. Write an expression for his age.

A - 8 = D
A = Alyah D = DeAndre

(3) Marie has 3 more than twice as many crayons as Davy. Write an expression to represent the number of crayons Marie has.

M = 2d + 3

★ TIP: Not sure if your answer is correct?? Check it with substitution! ★

Check the example above: DeAndre is 8 years younger than his sister, Alyah. Write an expression for his age.

Think about it... when Alyah is 10, DeAndre is 8 years younger... so he's 4. $10 - 8 = 4$
 when Alyah is 12, DeAndre is 8 years younger... so he's 6. $12 - 8 = 4$
 when Alyah is 25, DeAndre is 8 years younger... so he's 17. $25 - 8 = 17$

So, did the expression $y = 8$, work, when y represents Alyah's age? YES!

YOU TRY! Write an expression for each situation below. Also, identify what the variable represents.

1) Freddy earned \$8 for his chores last week. Write an expression for the amount of money he has left.

$$F + 9$$

2) A carnival charges \$10 admission and \$2.50 per ride. Write an expression for the amount of money needed for entry to the carnival.

$$10 + 2.50r$$

3) A lawyer charges \$300 for a new case, and \$150 per hour that she works on the case. Write an expression for the amount she charges per case.

$$300 + 150h$$