Solve for x:

$$-5(2x-4) + 3 = 10 - 1/3x + 2)$$

$$-10x + 20 + 3 = 10 - 3x - 2$$

$$-10x + 23 = 8 - 3x$$

$$-8 - 8$$

$$-10x + 15 = -3x$$

$$+10x$$

$$\frac{15}{7} = \frac{7x}{7}$$

$$\frac{15}{7} = x$$

What if we don't combine like terms after distributing?

Same answer, but an extra step!

Name Key Homework Questions?

Solving for a Variable using Multiple Steps Practice

1.
$$|18 = 3(3x - 6)|$$
 $|18 = 9x - 18|$
 $|18 = 418|$
 $|36| = 9x|$
 $|48| = 4x|$

2.
$$30 = -5(6n + 6)$$

$$30 = -30n -30$$

$$+30 +30$$

$$-30 -30$$

$$-2 = n$$

3.
$$37 = -3 + 5(x + 6)$$

 $37 = -3 + 5 \times +30$
 $37 = 5 \times +27$
 -27
 -27
 -27
 -27
 -27
 -27
 -27
 -27
 -27
 -27
 -27
 -27
 -27

4.
$$4(-x+4) = 12$$

$$-4x+16=12$$

$$-16-16$$

$$-4x=-4$$

$$-4=1$$

$$x=1$$

5.
$$-2 = -(n-8)$$

$$-2 = -1 (n-8)$$

$$-2 = -n+8$$

$$-8$$

$$-10 = -n$$

$$-1$$

6.
$$-13 = 5(1 + 4m) - 2m$$

$$-13 = 5 + 18m$$

$$-13 = 5 + 18m$$

$$-13 = 18m$$

$$-13 = 18m$$

$$-13 = 18m$$

7.
$$10(1+3b) = -20$$

$$10 + 30b = -30$$

$$-10 -10$$

$$30b = -30$$

$$30 30$$

$$b = -1$$

8.
$$8 = 8v - 4(v + 8)$$

9.
$$-5n - 8(1 + 7n) = -8$$

10.
$$8(4k-4) = -5k-32$$

11.
$$8(1+5x)+5=13+5x$$

12.
$$-11 - 5a = 6(5a + 4)$$

$$-1=a$$

How do we solve for x?

We need to get "x" ... alone

How do we do this?

Use inverse operations

We can do whatevel we want as long as we use the Properties of Equality.

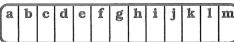
Steps to follow:

- · Distribute (if needed)
- Combine Like Terms
- Properties of Equality

Choice of either side of the Puzzle Sheet.

What Do You Call Someone Who Can't Turn Pancakes?

Cross out the letter pair next to each correct solution. For each letter pair you DON'T cross out, write the upper case letter in the box containing the lower case letter.



- 1 9y + 4 = 2y + 25
- 2 5n 2 = n + 18
- 3) 11 + 8q = 3q 19
- 4 3 10x = 25 + 4x

- 515a = 6a 90
- 6 24 5d = d
- Xavier is thinking of a number. Nine more than four times the number is the same as fifteen less than twice the number. What is Xavier's number?

f•I d · R -12 1.F 3 b • A 7 ioE -10 g · S 5

e · N 4

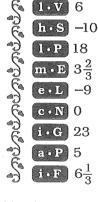
- 8 2 + 11b = 8b + 15
- 9) 7m + 32 = 12 m
- 10 16 5y = 1 4y
- 111 2x 8x + 1 = 9 10x
- 12 -3t 8 + 7t = 34 + 9t 2 13 2a + 3a + 4a = 5a 18
- 14 Yvonne is thinking of a number. Fifty, decreased by three times the number, is the same as seven times the number, increased by 80. What is Yvonne's number?
- c · N 15 $[\mathbf{k} \cdot \mathbf{0}] - 6$ e·H -2 h · D 2

d.F 11

e · T | -8

- 15 5(x+4) = 7x 26
- $16 \ 20 9w = 4(15 w)$
- 17 2(11 + 3n) = 12n
- 18 10 4(p + 7) = 2(1 p)
- 19 11x = 8x 3(5 2x) 20 9 6(4u 1) = u + 15
- 21 Zabato is thinking of a number. Three times the sum of the number and ten is the same as eight times the number. What is Zabato's number?

Equations and Problems: Solving Equations With the Variable on Both Sides



PUNCHLINE · Algebra · Book A ©2006 Marcy Mathworks



Why Do Cowboys Have So Much Trouble With Math?



Solve each equation or problem and find your solution in the answer column. Write the letter of the answer in each box that contains the exercise number. If the answer has a , shade in the box instead of writing a letter in it.

- (2) 9n 2 = 7n + 50
- (3) 18 5y = y + 4
- $\boxed{4} -7a 10 = 20 3a$
- (5) 11d = 81 16d
- (6) -22 x = 5 + 6x + 9
- (7) 10b 25 3b = 4b 1
- (8) 33 + 15w = 3w w + 4w
- (9) The Sun Spa charges annual dues of \$125 plus \$10 per hour to use the facilities. The Moon Spa charges annual dues of \$230 plus \$7 per hour to use the facilities. For what number of hours would the two spas charge the same total amount?
- (10) 9(m-2) = m+40 (11) 3(2p+7) = 15(p-4)
- (12) 5x + 2(11 4x) = 82 + x (13) 16 5(3t 4) = 8(-2t + 11)
- **14** 7(7c+1) 4c = 13(3c-2) **15** 12(5+2y) = 4y (6-9y)
- **16** 3q 16q = 7 + 2(-8q 3) **17** 14 3(5t 12) = 1 (20t + 1)
- (18) Simon says: "Five times my age 4 years ago is the same as 3 times my age in 2 years." How old is Simon now?



- (D) 35
- **(S**) 26
- **(M)** 18

- **F**) 12
- (U) -6
- 5 16 14 10 12 2 13 17 5 | 16 | 4 | 18 | 11 | 2 | 13 | 15 | 8 1 15 18 9 6

Homework

Finish classwork

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How do we solve for x?

We need to get "x" ... alone on one side of the equation and numbers on the other.

How do we do this?

Using Properties of Equality

We can do whatever we want as long as we use the Properties of Equality.

Steps to follow:

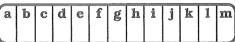
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(doing the same thing to both sides)

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1.V 6 h·s -10 e.L -9 $\mathbf{c} \cdot \mathbf{N} = 0$ i · G 23

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