3.3 - Equations With Variables on Both Sides

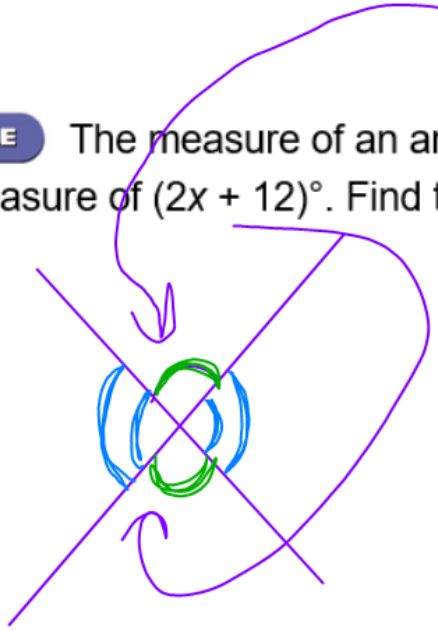
Vocabulary:

identity -

$3 \cdot 1 = 3$

$2x + 9 = 2x + 9$

1 EXAMPLE The measure of an angle is $(5x - 3)°$. Its vertical angle has a measure of $(2x + 12)°$. Find the value of x.



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$5x - 3 = 2x + 12$

$-2x \quad -2x$

$3x - 3 = 12$

$+3 \quad +3$

$3x = 15$

$x = 5$

Solve each equation. Check your answer.

1. $6x - 2 = x + 13$

$-x \quad -x$

$5x - 2 = 13$

$+2 \quad +2$

$5x = 15$

$x = 3$

2. $5y - 3 = 2y + 12$

$-2y \quad -2y$

$3y - 3 = 12$

$+3 \quad +3$

$3y = 15$

$y = 5$

2 EXAMPLE You can buy a skateboard for $60 from a friend and rent the safety equipment for $1.50 per hour. Or you can rent all items you need for $5.50 per hour. How many hours must you use a skateboard to justify buying your friend's skateboard?

$60 + 1.5h = 5.5h$

$-1.5h \quad -1.5h$

6

$\frac{60}{4} = \frac{4h}{4}$

$15 = h$

hours

11. Telephone Service One telephone company charges $16.95 per month and $.05 per minute for local calls. Another company charges $22.95 per month and $.02 per minute for local calls. For what number of minutes of local calls per month is the cost of the plans the same?

$16.95 + 0.05m = 22.95 + 0.02m$

$-0.02m \quad\quad -0.02m$

$16.95 + 0.03m = 22.95$

$-16.95 \quad\quad -16.95$

$0.03m = 6$

$\frac{0.03m}{0.03} = \frac{6}{0.03}$

$m = 200$ minutes

3 EXAMPLE Solve $2.5x \pm 1 \neq 4x - 2.6$ using a graphing calculator.

13. $7(3 - k) = -3k + 4$

$21 - 7k = -3k + 4$

$+7k \quad +7k$

$21 = 4k + 4$

$-4 \quad -4$

$17 = 4k$

$\frac{17}{4} = \frac{4k}{4}$

$4\frac{1}{4} = k$

4 EXAMPLE Solve each equation.

a. $4 - 4y = -2(2y - 2)$

$4 - 4y = -4y + 4$

$+4y \quad +4y$

$4 = 4$

identity

b. $-6z + 8 = z + 10 - 7z$

$-6z + 8 = -6z + 10$

$8 \neq 10$

NO Solution

19. $6x + 1 = 6x - 8$ NO solution

21. $y - 5 = -1(5 - y)$

$= -5 + y$

identity

HW: pg. 137 #7, 10, 12, 21, 25, 31, 33, 37, 48, 57