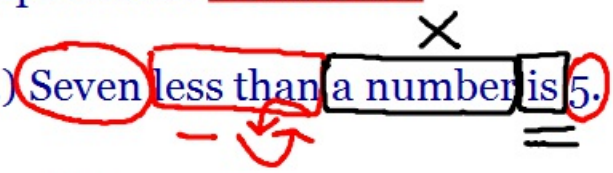
Warm Up October 1, 2018

Translate the following verbal expressions into algebraic expressions then solve.

1.) Seven less than a number is 5.

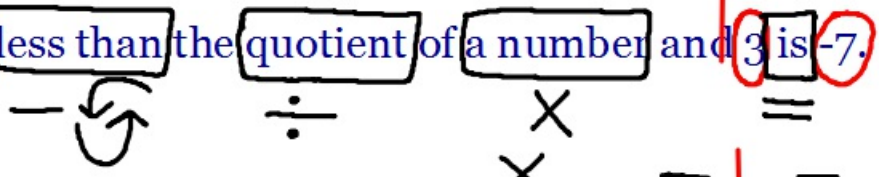


$x - 7 = 5$

$+7 \quad +7$

$x = 12$

2.) Five less than the quotient of a number and 3 is -7.



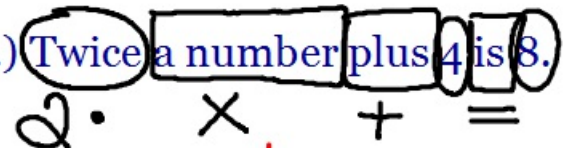
$\frac{x}{3} - 5 = -7$

$+5 \quad +5$

$\frac{x}{3} = -2$

$x = -6$

3.) Twice a number plus 4 is 8.



$2x + 4 = 8$

$-4 \quad -4$

$2x = 4$

$x = 2$

4.) Solve for p:

$11 - (2 + p) = -17$

$11 - 2 - p = -17$

$9 - p = -17$

$-9 \quad -9$

$-p = -26$

$p = 26$

5.) Solve for k:

$k^2 + 3 = 28$

$-3 \quad -3$

$\sqrt{k^2} = \sqrt{25}$

$k = 5$

Topic: Variables on Both Sides	Date:

Main Ideas/Questions	Notes	
Steps	1	Distribute
	2	Combine like terms.
	3	Use + or - to move the smallest variable
	4	Undo the constant (+ or -)
	5	Undo the coefficient (x or ÷)

1. $5y - 8 = 3y + 12$

$-3y \quad -3y$

$2y - 8 = 12$

$+8 \quad +8$

$\frac{2y}{2} = \frac{20}{2}$

$y = 10$

2. $-6x + 14 = 12 - 8x$

$+8x \quad +8x$

$2x + 14 = 12$

$-14 \quad -14$

$\frac{2x}{2} = \frac{-2}{2}$

$x = -1$

5. $12 - 2u = 9u + 45$

$+2u \quad +2u$

$12 = 11u + 45$

$-45 \quad -45$

$-33 = 11u$

$\frac{-33}{11} = \frac{11u}{11}$

$-3 = u$

6. $4(2w - 1) = -10(w - 5)$

$8w - 4 = -10w + 50$

$+10w \quad +10w$

$18w - 4 = 50$

$+4 \quad +4$

$\frac{18w}{18} = \frac{54}{18}$

$w = 3$

11.) $5x - (x - 18) = 6 - 2(x+15)$

$5x - x + 18 = 6 - 2x - 30$

$4x + 18 = -2x - 24$

$+2x \quad +2x$

$6x + 18 = -24$

$-18 \quad -18$

$\frac{6x}{6} = \frac{-42}{6}$

$x = -7$

12. $8(y + 4) - 2(y - 1) = 70 - 3y$

$8y + 32 - 2y + 2 = 70 - 3y$

$6y + 34 = 70 - 3y$

$+3y \quad +3y$

$9y + 34 = 70$

$-34 \quad -34$

$\frac{9y}{9} = \frac{36}{9}$

$y = 4$

Variables on Both Sides...With Fractions!

When an equation contains fractions on both sides, it is helpful to multiply both sides by a common denominator.

$$\frac{x}{2} + 5 = \frac{x}{3} + 8$$

What is the common denominator?

1) $\frac{5x}{4}+2=\frac{x}{4}+7$

$\frac{4}{1}\left(\frac{5x}{4}+2\right)=4\left(\frac{x}{4}+7\right)$

$\frac{20x}{4}+8=\frac{4x}{4}+28$

$5x+8=x+28$

$-x \quad -x$

$4x+8=28$

$-8 \quad -8$

$\frac{4x}{4}=\frac{20}{4}$

$x=5$

2) $\frac{x}{2}-3=\frac{x}{7}+2$

$\frac{14}{1}\left(\frac{x}{2}-3\right)=\frac{14}{1}\left(\frac{x}{7}+2\right)$

$\frac{14x}{2}-42=\frac{14x}{7}+28$

$7x-42=2x+28$

$-2x \quad -2x$

$5x-42=28$

$+42 \quad 42$

$\frac{5x}{5}=\frac{70}{5}$

$x=14$

$\frac{x}{5}+7=\frac{x}{10}+8$

$\frac{10}{1}\left(\frac{x}{5}+7\right)=\frac{10}{1}\left(\frac{x}{10}+8\right)$

$2x+70=x+80$

$-x \quad -x$

$x+70=80$

$-70 \quad -70$

$x=10$