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Name: Key Date: _____

# Using the Distributive Property in Solving Linear Equations
## Algebra 1 Homework

### Skills

1. Which of the following equations illustrates the distributive property?

(1) $3+(5+2)=(3+5)+2$ (3) $5(52)=5(50+2)=250+10$

(2) $5\cdot(3\cdot2)=(5\cdot3)\cdot2$ (4) $5\cdot3=3\cdot5$?

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2. Which of the following values of $x$ solves the equation $7(x+9)=3(2x+19)$?

(1) $-8$ (3) 7

(2) 5 (4) $-6$

$7x+63=6x+57$
$-6x \quad -6x$
$x+63=57$
$-63 \quad -63$
$x=-6$

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3. Rewrite each of the following expressions without parentheses.

(a) $4(2x-7)$ $8x-28$

(b) $-3(x+6)$ $-3x-18$

(c) $-(-5x+8)$ $5x-8$

(d) $\frac{1}{2}(4x+20)$ $2x+10$

4. Determine the solution to each of the following equations. Check your answers and list the properties.

(a) $5(x-3)=20$

$5x-15=20$ Dist. Prop
$+15 \quad +15$ A.P.O.E
$\frac{5x}{5}=\frac{35}{5}$ D.P.O.E.
$x=7$

(b) $2(x-4)=14$

$2x-8=14$ Dist. Prop
$+8 \quad +8$ A.P.O.E.
$\frac{2x}{2}=\frac{22}{2}$ D.P.O.E
$x=11$

(c) $4(2x+1)=5(3x+5)$ G.C

$8x+4=15x+25$ Dist. Prop
$-8x \quad -8x$ S.P.O.E
$4=7x+25$
$-25 \quad -25$ S.P.O.E
$\frac{-21}{7}=\frac{7x}{7}$ D.P.O.E.
$x=-3$

(d) $x-(7-x)=35$ C.L.T by hor. Dist. Prop

$x-7+x=35$ C.L.T
$2x-7=35$ A.P.O.E
$+7 \quad +7$
$\frac{2x}{2}=\frac{42}{2}$ D.P.O.E
$x=21$

Chk
$x-(7-x)=35$
$21-(7-21)=35$
$21-(-14)=35$
$35=35$

(e) $9-2(y+4)=17$

$9-2y-8=17$ Dist. Prop.
$1-2y=17$ C.L.T
$-1 \quad -1$ S.P.O.E.
$\frac{-2y}{-2}=\frac{16}{-2}$ D.P.O.E
$y=-8$

(f) $3(2x+5)=9x+10$

$6x+15=9x+10$ Dist. Prop
$-6x \quad -6x$ S.P.O.E
$15=3x+10$
$-10 \quad -10$ S.P.O.E
$\frac{5}{3}=\frac{3x}{3}$ D.P.O.E
$x=1\frac{2}{3}$

5. Write an equation for each of the following sentences and solve for the described number.

(a) Seven times the sum of a number and six is 49.

Let x = the #

$7(x+6)=49$

$7x+42=49$

$-42 \quad -42$

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

$x=1$

the # is 1

(b) Three-halves of the difference of a number and two is one more than twice the same number.

Let x = the #

$\frac{3}{2}(x-2)=2x+1$

$\frac{3}{2}x-3=2x+1$

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

$-3=\frac{1}{2}x+1$

$-4=\frac{1}{2}x$

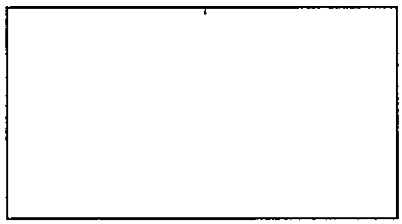
$(2)-4=\frac{1}{2}x(2)$

$x=-8$

the # is -8

## Applications

6. A rectangle has dimensions, in feet, as shown in the figure.




(a) Write an expression for the area of the rectangle.

$A = l \cdot w$

$A = 8(2x+5)$ or $A = 16x+40$

(b) Find the area of the rectangle, in square feet, if $x = 3$.

$A = 16x+40$

$A = 16(3)+40$

$A = 48+40$

$A = 88$ ft$^2$

or $A = 8(2x+5)$

$A = 8(2(3)+5)$

$A = 8(6+5)$

$A = 8(11)$

$A = 88$ ft$^2$

(c) Find the value of $x$ if the area of the rectangle is 160 square feet.

$16x+40=160$

$-40 \quad -40$

$\frac{16x}{16}=\frac{120}{16}$

$x = 7\frac{1}{2}$

or $8(2x+5)=160$

$16x+40=160$

$-40 \quad -40$

$\frac{16x}{16}=\frac{120}{16}$

$x = 7\frac{1}{2}$

## Reasoning

7. Consider the equation $y = 5(2x-3)$.

(a) Rewrite this equation without parentheses on the right hand side.

$y = 10x-15$

(b) Using your calculator, enter $y = 5(2x-3)$ into $\mathbf{Y_1}$ and your answer from part (a) into $\mathbf{Y_2}$.

(c) Fill in the table below for each value of $x$.

| $x$ | $\mathbf{Y_1}$ | $\mathbf{Y_2}$ |
|---|---|---|
| -3 | | |
| 0 | | |
| 1.5 | | |
| 7 | | |

(d) What can you say about the two equations that you entered?