Name Answers Date

2.4 – Algebraic and Congruence Properties

Write a reason for each step.

1) $4x-5=-2$ — Given
$4x=3$ — Addition Prop. of Eq.
$x=\frac{3}{4}$ — Division Prop. of Eq.

2) $15y+7=12-20y$ — Given
$35y+7=12$ — Addition Prop of Eq.
$35y=5$ — Subtraction Prop of Eq.
$y=\frac{1}{7}$ — Division Prop of Eq.

3) $\frac{2}{3}b=8-2b$ — Given
$2b=3(8-2b)$ — Multiplication Prop. of Eq.
$2b=24-6b$ — Distributive Prop.
$8b=24$ — Addition Prop. of Eq.
$b=3$ — Division Prop of Eq.

4) $x-2=\frac{2x+8}{5}$ — Given
$5(x-2)=2x+8$ — Mult. Prop. of Eq.
$5x-10=2x+8$ — Distributive Property
$3x-10=8$ — Subtraction Prop of Eq.
$3x=18$ — Addition Prop. of Eq.
$x=6$ — Division Prop of Eq.

Solve the equation. Write a reason for each step.

5) $44-2(3x+4)=-18x$ — Given
$44-6x-8=-18x$ — Dist. Prop.
$36-6x=-18x$ — Simplify
$36=-12x$ — Add. Prop. of Eq.
$-3=x$ — Div. Prop. of Eq.

6) $3(7x-9)-19x=-15$ — Given
$21x-27-19x=-15$ — Dist. Prop
$2x-27=-15$ — Simplify
$2x=12$ — Add. Prop of Eq.
$x=6$ — Div. Prop of Eq.

Solve the equation for y. Write a reason for each step.

7) $12-3y=30x$

$-3y=30x-12$ Sub. Prop. of Eq.

$y=-10x+4$ Div. Prop of Eq.

Given

8) $\frac{1}{2}x-\frac{3}{4}y=-2$

$2x-3y=-8$ Mult. Prop of Eq.

$-3y=-2x-8$ Sub. Prop of Eq.

$y=\frac{-2x-8}{-3}$ Div. Prop of Eq.

Given

For #7-11, use the property to complete the statement.

7) Substitution Property of Equality — If $AB=20$, then $AB+CD=$ 20+CD

8) Symmetric Property of Equality — If $m\angle 1=m\angle 2$, then mL2=mL1

9) Addition Property of Equality — If $AB=CD$, then AB $+EF=$ CD $+EF$

10) Distributive Property of Equality — If $5(x+8)=2$, then 5 $x+$ 40 $=2$

11) Transitive Property of Equality — If $m\angle 1=m\angle 2$ and $m\angle 2=m\angle 3$, then mL1=mL3

12) The formula for the perimeter P of a rectangle $P=2l+2w$ where l is the length and w is the width. Solve the formula for l, and write a reason for each step. Then find the length of a rectangular lawn whose perimeter is 55 meters and whose width is 11 meters.

$P=2l+2w$ Given

$P-2w=2l$ Sub. Prop of Eq.

$\frac{P-2w}{2}=l$ Div. Prop of Eq.

$\frac{P-2w}{2}=l$

$\frac{55-2(11)}{2}=l$

$\boxed{16.5m=l}$