

Name _____

Date _____

1.D – Reasoning Using Properties of Algebra

Write a reason for each step.

1) $4x - 5 = -2$ _____
 $4x = 3$ _____
 $x = \frac{3}{4}$ _____

2) $15y + 7 = 12 - 20y$ _____
 $35y + 7 = 12$ _____
 $35y = 5$ _____
 $y = \frac{1}{7}$ _____

3) $\frac{2}{3}b = 8 - 2b$ _____
 $2b = 3(8 - 2b)$ _____
 $2b = 24 - 6b$ _____
 $8b = 24$ _____
 $b = 3$ _____

4) $x - 2 = \frac{2x + 8}{5}$ _____
 $5(x - 2) = 2x + 8$ _____
 $5x - 10 = 2x + 8$ _____
 $3x - 10 = 8$ _____
 $3x = 18$ _____
 $x = 6$ _____

Solve the equation. Write a reason for each step.

5) $44 - 2(3x + 4) = -18x$

6) $3(7x - 9) - 19x = -15$

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

7) $12 - 3y = 30x$

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

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

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

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

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

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

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

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.