A.REI.A.1: Identifying Properties 1b

1 A teacher asked the class to solve the equation $3(x+2)=21$. Robert wrote $3x+6=21$ as his first step. Which property did he use?

2 While solving the equation $4(x+2)=28$, Becca wrote $4x+8=28$. Which property did she use?

3 When solving $p^2+5=8p-7$, Kate wrote $p^2+12=8p$. The property she used is

4 When solving the equation $4(3x^2+2)-9=8x^2+7$, Emily wrote $4(3x^2+2)=8x^2+16$ as her first step. Which property justifies Emily's first step?

5 A part of Jennifer's work to solve the equation $2(6x^2-3)=11x^2-x$ is shown below.

Given: $2(6x^2-3)=11x^2-x$

Step 1: $12x^2-6=11x^2-x$

Which property justifies her first step?

6 When solving the equation $12x^2-7x=6-2(x^2-1)$, Evan wrote $12x^2-7x=6-2x^2+2$ as his first step. Which property justifies this step?

7 When solving for the value of x in the equation $4(x-1)+3=18$, Aaron wrote the following lines on the board.

[line 1] $4(x-1)+3=18$
[line 2] $4(x-1)=15$
[line 3] $4x-1=15$
[line 4] $4x=16$
[line 5] $x=4$

Which property was used *incorrectly* when going from line 2 to line 3?

8 Britney is solving a quadratic equation. Her first step is shown below.

Problem: $3x^2-8-10x=3(2x+3)$

Step 1: $3x^2-10x-8=6x+9$

Which two properties did Britney use to get to step 1?

I. addition property of equality
II. commutative property of addition
III. multiplication property of equality
IV. distributive property of multiplication over addition

9 In the process of solving the equation $10x^2 - 12x - 16x = 6$, George wrote $2(5x^2 - 14x) = 2(3)$, followed by $5x^2 - 14x = 3$. Which properties justify George's process?

A. addition property of equality
B. division property of equality
C. commutative property of addition
D. distributive property

10 A method for solving $5(x - 2) - 2(x - 5) = 9$ is shown below. Identify the property used to obtain each of the two indicated steps.

$5(x - 2) - 2(x - 5) = 9$
(1) $5x - 10 - 2x + 10 = 9$ (1) _____
(2) $5x - 2x - 10 + 10 = 9$ (2) _____
$3x + 0 = 9$
$3x = 9$
$x = 3$

11 John was given the equation $4(2a + 3) = -3(a - 1) + 31 - 11a$ to solve. Some of the steps and their reasons have already been completed. State a property of numbers for each missing reason.

$4(2a + 3) = -3(a - 1) + 31 - 11a$	Given
$8a + 12 = -3a + 3 + 31 - 11a$	_____
$8a + 12 = 34 - 14a$	Combining like terms
$22a + 12 = 34$	_____

12 A student is in the process of solving an equation. The original equation and the first step are shown below.

Original: $3a + 6 = 2 - 5a + 7$

Step one: $3a + 6 = 2 + 7 - 5a$

Which property did the student use for the first step? Explain why this property is correct.

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Answer Section

1 ANS:
distributive property

REF: 081419ia

2 ANS:
distributive

REF: 080601a

3 ANS:
the addition property of equality

REF: 061909ai

4 ANS:
addition property of equality

REF: 061401ai

5 ANS:
distributive property of multiplication over subtraction

REF: 081701ai

6 ANS:
distributive property of multiplication over subtraction

REF: 011801aii

7 ANS:
distributive

REF: 061405ia

8 ANS:
II and IV

REF: 011908ai

9 ANS:
D and *B*

REF: 082219ai

10 ANS:
(1) Distributive; (2) Commutative

REF: 061132ia

11 ANS:
Distributive and Addition Property of Equality

REF: 012029ai

12 ANS:
Commutative, This property is correct because $x + y = y + x$.

REF: 081926ai