

UNIT #2 – REVIEW SHEET! 😊

Part I Questions:

Study Study!

1. The value $x = 4$ is a solution to all of the following equations except which?

- (1) $2x + 7 = 15$ (3) $x + 5 = 3x - 3$ (1) $2(4) + 7 = 15$ (3) $(4) + 5 = 3(4) - 3$
 $8 + 7 = 15$ $9 = 12 - 3$
 $15 = 15 \checkmark$ $9 = 9 \checkmark$
- (2) $3(x + 1) = x + 11$ (4) $x + 12 = 5x - 2$ (2) $3(4 + 1) = (4) + 11$ (4) $(4) + 12 = 5(4) - 2$
 $3(5) = 15$ $16 = 20 - 2$
 $15 = 15 \checkmark$ $16 \neq 18 \times$

4

2. Which of the following is the solution to $\frac{x}{5} + 3 = 10$?

- (1) 47 (3) 35 $5 \cdot \frac{x}{5} = 7 \cdot 5$
 $x = 35$
- (2) -1 (4) -5

3

3. The sum of a number, n , and a number 5 larger than it is 41. Which of the following equations could be used to solve for the number?

- (1) $n + 5n = 41$ (3) $5(n + 1) = 41$ let $n =$ a number
 let $n + 5 =$ a number 5 larger than n
- (2) $n + n + 5 = 41$ (4) $5n + n + 1 = 41$ $n + n + 5 = 41$

2

4. Which of the following is *not* an equation?

- (1) $5(2x + 1) = 10x + 5$ (3) $5 + 3 = 10$
- (2) $4x - 1$ (4) $\frac{x}{2} + 1 = 7$

2

5. Which of the following values of x solves $3(x - 6) = 18$?

- (1) $x = 12$ (3) $x = 8$ $3x - 18 = 18$
 $+18 \quad +18$
- (2) $x = 0$ (4) $x = -6$ $\frac{3x}{3} = \frac{36}{3}$
 $x = 12$

1

6. (Challenge!) If the expression $\frac{2x}{a} + b = c$ is solved for x in terms of a , b , and c , then $x =$

(1) $\frac{ac - ab}{2}$

(3) $\frac{ac - b}{2}$

$\frac{2x}{a} + b = c$
 $\quad \quad \quad -b \quad -b$

(2) $\frac{b+c}{2a}$

(4) $\frac{ab+c}{2}$

$a \cdot \frac{2x}{a} = (c-b) \cdot a$
 $\frac{2x}{2} = \frac{a(c-b)}{2}$

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

1

7. Jenna manipulated the equation $4x + 7 = 10$ by adding -7 to both sides. Which of the following properties justifies this manipulation?

(1) The associative property of addition.

(2) The addition property of equality.

(3) The commutative property of addition.

(4) The multiplication property of equality.

2

8. Jody's older brother is only three years less than twice Jody's age. If the sum of their ages is 30, then which of the following is the age of Jody's brother?

(1) 7

(3) 19

let $x =$ Jody's age $\rightarrow 11$

$x + 2x - 3 = 30$

(2) 11

(4) 23

let $2x - 3 =$ Jody's older brother's age

$3x - 3 = 30$
 $\quad \quad \quad +3 \quad +3$

$2(11) - 3$
 $22 - 3$
 19

$\frac{3x}{3} = \frac{33}{3}$

$x = 11$

3

Free Response Questions:

9. Two correct first steps are shown for the same equation below. What property justifies each step?

$5(x-3) = 20$
 $5x - 15 = 20$

DISTRIBUTIVE
PROPERTY

$5(x-3) = 20$
 $x-3 = 4$

$\frac{5(x-3)}{5} = \frac{20}{5}$

$x-3 = 4$

? we did not distribute here, we divided both sides by 5, first!
 NOT THIS TIME

10. Two consecutive even integers have the following property. When the smaller integer is added to three times the larger integer, the result is two less than five times the smaller integer.

Rafael tries to model this scenario with the equation show below. Unfortunately, Rafael has made an error on the left side of the equation. Explain what error he made.

Note:
Rafael is using n , I used x .

$$n + 3n + 2 = 5n - 2$$

let $x = 1^{\text{st}}$ consecutive even integer
 let $x + 2 = 2^{\text{nd}}$ consecutive even integer

SMALLER # LARGER #

$$x + 3(x+2) = 5x - 2$$

Rafael did not use parenthesis!

Write the correct equation (if you haven't already) and solve it to find the two consecutive even integers.

$$\begin{aligned} x + 3(x+2) &= 5x - 2 \\ x + 3x + 6 &= 5x - 2 \\ 4x + 6 &= 5x - 2 \\ \underline{-4x} \quad \underline{-4x} & \end{aligned}$$

$$\begin{aligned} 6 &= x - 2 \\ +2 & \quad +2 \\ 8 &= x \end{aligned}$$

8, 10

11. Algebraically, solve to find three consecutive odd integers that have a sum of 75.

let $x = 1^{\text{st}}$ consecutive odd integer
 let $x + 2 = 2^{\text{nd}}$ consecutive odd integer
 let $x + 4 = 3^{\text{rd}}$ consecutive odd integer

$$x + x + 2 + x + 4 = 75$$

$$\begin{aligned} 3x + 6 &= 75 \\ \underline{-6} \quad \underline{-6} & \\ 3x &= 69 \\ \underline{\quad} \quad \underline{\quad} & \\ x &= 23 \end{aligned}$$

23, 25, 27

12. Solve for p :

$$\begin{aligned} 5p - 14 &= 8p + 4 \\ \underline{+14} \quad \underline{+14} & \end{aligned}$$

$$\begin{aligned} 5p &= 8p + 18 \\ \underline{-8p} \quad \underline{-8p} & \end{aligned}$$

$$\begin{aligned} -3p &= 18 \\ \underline{-3} \quad \underline{-3} & \end{aligned}$$

$p = -6$

13. Solve for x:

$$\begin{array}{c} \curvearrowright \quad \curvearrowright \\ -3(4x+3) + 4(6x+1) = 43 \end{array}$$

$$\boxed{-12x} \boxed{-9} + \boxed{24x} \boxed{+4} = 43$$

$$\begin{array}{r} 12x - 9 = 43 \\ \quad +9 \quad +9 \end{array}$$

$$\frac{12x}{12} = \frac{48}{12}$$

$$x = 4$$

14. Solve for x in terms of a, b, and c:

$$\begin{array}{r} x^2 + c = a \\ \quad -c \quad -c \end{array}$$

SQUARE
ROOT.

$$\sqrt{x^2} = \sqrt{a-c}$$

$$x = \sqrt{a-c}$$

15. Solve for x in terms of a, b, and c:

$$\begin{array}{r} \frac{2x}{c} - a = b \\ \quad +a \quad +a \end{array}$$

$$\cancel{c} \cdot \frac{2x}{\cancel{c}} = (b+a) \cdot c$$

$$2x = c(b+a)$$

$$\frac{2x}{2} = \frac{cb+ca}{2}$$

$$x = \frac{cb+ca}{2}$$

$$\begin{array}{r} \frac{2x}{c} - a = b \\ \quad +a \quad +a \end{array}$$

OR ~~$$\frac{2x}{c} = b+a$$~~

$$\frac{2x}{2} = \frac{c(b+a)}{2}$$

$$\longleftrightarrow x = \frac{c(b+a)}{2}$$

Both
correct.