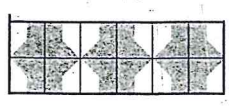


Versatile Equations Review

<p>1</p> $\begin{array}{r}  5x  - 1 = 24 \\ +1 \quad +1 \\ \hline  5x  = 25 \\ 5x = 25 \quad 5x = -25 \\ \hline x = 5 \quad x = -5 \end{array}$ <p>L <math>\{-5, 5\}</math></p>	<p>2</p> $\begin{array}{r} \frac{1}{2}(y+8) = \frac{3}{2}y - 2 \\ \frac{1}{2}y + 4 = \frac{3}{2}y - 2 \\ -\frac{1}{2}y \quad -\frac{3}{2}y \\ \hline -y + 4 = -2 \\ -y + 4 = -2 \\ \hline -y = -6 \\ y = 6 \end{array}$ <p>H</p>	<p>3</p> <p>4 times the sum of x and y</p> <p><math>4(x+y)</math> I</p>
<p>4</p> $\begin{array}{r} 3(10+a) \div (12-3) \\ 3 \cdot 12 \div 9 \\ 36 \div 9 \\ \hline 4 \end{array}$ <p>K</p>	<p>5</p> $\begin{array}{r} 2(y-8) = 12 - 2y \\ 2y - 16 = 12 - 2y \\ +2y \quad +2y \\ \hline 4y - 16 = 12 \\ +16 \quad +16 \\ \hline 4y = 28 \\ y = 7 \end{array}$ <p>C</p>	<p>6</p> $\begin{array}{r} -4(2x+1) = -8x - 2 \\ -8x - 4 = -8x - 2 \\ +8x \quad +8x \\ \hline -4 = -2 \end{array}$ <p>no solution G</p>
<p>7</p> $\begin{array}{r} xy + 5 = n \\ -5 \quad -5 \\ \hline xy = n - 5 \\ \frac{xy}{x} = \frac{n-5}{x} \\ \hline y = \frac{n-5}{x} \end{array}$ <p>E</p> <p>solve for y</p>	<p>8</p> $\begin{array}{r} 5x - 3y + 2x + 7y \\ \hline 7x + 4y \end{array}$ <p>B</p>	<p>9</p> $\begin{array}{r} by + 12 - 2y = 4(y+3) \\ 4y + 12 = 4y + 12 \\ -4y \quad -4y \\ \hline 12 = 12 \end{array}$ <p>All real #'s J</p>
<p>10</p> $\begin{array}{r} 2(3y-4) = 8y - 11 \\ 6y - 8 = 8y - 11 \\ -8y \quad -8y \\ \hline -2y - 8 = -11 \\ -2y + 8 = -11 \\ +8 \quad +8 \\ \hline -2y = -3 \\ y = \frac{3}{2} \end{array}$ <p>F</p>	<p>11</p> $\begin{array}{r}  2x-4  = 12 \\ 2x-4 = 12 \quad 2x-4 = -12 \\ +4 \quad +4 \quad +4 \quad +4 \\ \hline 2x = 16 \quad 2x = -8 \\ \frac{2x}{2} = \frac{16}{2} \quad \frac{2x}{2} = \frac{-8}{2} \\ x = 8 \quad x = -4 \end{array}$ <p>D <math>\{-4, 8\}</math></p>	<p>12</p> $\begin{array}{r} 8y - 3 = 5y + 6 \\ -5y \quad -5y \\ \hline 3y - 3 = 6 \\ +3 \quad +3 \\ \hline 3y = 9 \\ \frac{3y}{3} = \frac{9}{3} \\ y = 3 \end{array}$ <p>A</p>

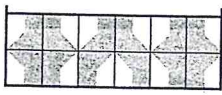
A $y = 3$	B $7x + 4y$	C $y = 7$	D $-4, 8$	E $y = \frac{n-5}{x}$	F $y = \frac{3}{2}$
G no solution	H $y = 6$	I $4(x+y)$	J all real #'s	K 4	L $-5, 5$



# Key

$1 \quad 7(10+1) \div (2^3+3)$ $7 \cdot 11 \div (8+1)$ $7 \cdot 11 \div 11$ $77 \div 11$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b>7 J</b></p>	$2 \quad 5y - 2x - 2y - 7x$ $-9x + 3y \text{ or}$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b><math>3y - 9x</math> L</b></p>	$3 \quad 8 \text{ times the sum of } x \text{ and } y$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b><math>8(x+y)</math> G</b></p>
$4 \quad 3(y-4) = 20-y$ $3y - 12 = 20 - y$ $+y \quad +y$ <hr style="border: 0.5px solid red;"/> $4y - 12 = 20$ $+12 \quad +12$ <hr style="border: 0.5px solid red;"/> $4y = 32$ $\frac{4y}{4} = \frac{32}{4}$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b><math>y = 8</math> I</b></p>	$5 \quad  7y  + 2 = 37$ $\frac{ 7y }{-2} = \frac{35}{-2}$ <hr style="border: 0.5px solid red;"/> $ 7y  = 35$ $\frac{7y}{7} = 35 \quad \frac{7y}{7} = -35$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b><math>y = 5 \quad y = -5</math> { -5, 5 } A</b></p>	$6 \quad 3 - 9(y+2) = -6(5-y)$ $3 - 9y - 18 = -30 + 6y$ $-9y - 21 = -30 + 6y$ $-6y \quad -6y$ <hr style="border: 0.5px solid red;"/> $-15y - 21 = -30$ $+21 \quad +21$ <hr style="border: 0.5px solid red;"/> $-15y = -9$ $\frac{-15y}{-15} = \frac{-9}{-15}$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b><math>y = \frac{3}{5}</math> K</b></p>
$7 \quad 4(2y-3) = 8y+5$ $8y - 12 = 8y + 5$ $-8y \quad -8y$ <hr style="border: 0.5px solid red;"/> $-12 = 5$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b>no solution D</b></p>	$8 \quad xy + a = n \text{ solve for } y$ $\frac{xy}{-a} = \frac{n-a}{-a}$ <hr style="border: 0.5px solid red;"/> $\frac{xy}{x} = \frac{n-a}{x}$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b><math>y = \frac{n-a}{x}</math> F</b></p>	$9 \quad 10y + 4 = 7y + 1$ $-7y \quad -7y$ <hr style="border: 0.5px solid red;"/> $3y + 4 = 1$ $-4 \quad -4$ <hr style="border: 0.5px solid red;"/> $\frac{3y}{3} = \frac{-3}{3}$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b><math>y = -1</math> H</b></p>
$10 \quad 7y + 15 - 2y = 5(y+3)$ $5y + 15 = 5y + 15$ $5y \quad -5y$ <hr style="border: 0.5px solid red;"/> $15 = 15$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b>All real #s C</b></p>	$11 \quad  4y+8  = 20$ $4y+8 = 20 \quad 4y+8 = -20$ $\frac{4y+8}{-8} = \frac{12}{-8} \quad \frac{4y+8}{-8} = \frac{-28}{-8}$ <hr style="border: 0.5px solid red;"/> $\frac{4y}{4} = \frac{12}{4} \quad \frac{4y}{4} = \frac{28}{4}$ <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b><math>y = 3 \quad y = 7</math> { -7, 3 } B</b></p>	$12 \quad \frac{x+y}{w} = z \text{ solve for } y$ $\frac{x+y}{w} = wz$ $\frac{x+y}{x} = wz$ $x+y = wz$ $-x \quad -x$ <hr style="border: 0.5px solid red;"/> <p style="text-align: center; border: 1px solid red; border-radius: 50%; padding: 5px;"><b><math>y = wz - x</math> E</b></p>

A $y = \{-5, 5\}$	B $y = \{-7, 3\}$	C all real numbers	D no solution	E $y = wz - x$	F $y = \frac{n-a}{x}$
G $8(x+y)$	H $y = -1$	I $y = 8$	J 7	K $y = \frac{3}{5}$	L $3y - 9x$



# Unit 1 Test Review Sheet

Key

Name \_\_\_\_\_  
Math \_\_\_\_\_  
Date \_\_\_\_\_

## I. Vocab

Equation, Expression, Isolate the variable, Simplify Variable, Literal Equation, Solve, Distributive Property

- 1) solve To find all solutions to an equation
- 2) Isolate the variable To use inverse operations on both sides until the variable appears by itself
- 3) literal Equation An equation that contains 2 or more variables
- 4) Equation A mathematical statement that two expressions are equivalent
- 5) Simplify To perform all indicated operations
- 6) variable A symbol used to represent a quantity that can change
- 7) Distributive Property For all real number  $a, b + c : a(b+c) = ab + ac$
- 8) Expression A mathematical phrase that contains operations, numbers, and/or variables

## II

9)  $3(17+3) \div (15-3)$   
 $3(20) \div 12$   
 $60 \div 12$   
5

10)  $7x + 5y - 3x - 10y$   
 $4x - 5y$

11) 9 times the sum of  $x$  and  $y$   
 $9(x+y)$

12) 12 less than the product of 5 and  $y$   
 $5y - 12$

13)  $8y + 5 = -27$   
 $\frac{8y}{8} = \frac{-32}{8}$   
 $y = -4$

14)  $-15 = -2x - 3$   
 $\frac{-12}{-2} = \frac{-2x}{-2}$   
 $6 = x$

15)  $3(y-8) = 16 - 2y$   
 $3y - 24 = 16 - 2y$   
 $\frac{5y - 24}{+24} = \frac{16 - 2y}{+24}$   
 $\frac{5y}{5} = \frac{40}{5}$   
 $y = 8$

16)  $9x + 3 = 5x + 19$   
 $\frac{4x + 3}{-3} = \frac{19}{-3}$   
 $\frac{4x}{4} = \frac{16}{4}$   
 $x = 4$

$$(17) 4(2y-5) = by - 17$$

$$\begin{array}{r} 8y - 20 = by - 17 \\ -by \quad -by \\ \hline 2y - 20 = -17 \\ +20 \quad +20 \\ \hline 2y = 3 \\ \frac{2y}{2} = \frac{3}{2} \\ y = \frac{3}{2} \end{array}$$

$$(18) 8(2y-3) = 16y - 10$$

$$\begin{array}{r} 16y - 24 = 16y - 10 \\ -16y \quad -16y \\ \hline -24 = -10 \\ \text{no solution} \end{array}$$

$$(19) 5y + 12 - y = 4(y + 3)$$

$$\begin{array}{r} 4y + 12 = 4y + 12 \\ -4y \quad -4y \\ \hline 12 = 12 \end{array}$$

All real #s

$$(20) \frac{1}{4}(y+12) = \frac{3}{4}y + 13$$

$$\begin{array}{r} \frac{1}{4}y + 3 = \frac{3}{4}y + 13 \\ -\frac{3}{4}y \quad -\frac{3}{4}y \\ \hline -\frac{2}{4}y + 3 = 13 \\ -\frac{2}{4}y + 3 = 13 \\ -3 \quad -3 \\ \hline -\frac{2}{4}y = 10 \\ \frac{-2y}{-2} = \frac{40}{-2} \\ y = -20 \end{array}$$

$$(21) |7y| = 42$$

$$\begin{array}{r} 7y = 42 \quad 7y = -42 \\ \frac{7y}{7} \quad \frac{7y}{7} \\ \hline y = 6 \quad y = -6 \\ y = \{-6, 6\} \end{array}$$

$$(22) |2y-4| = 16$$

$$\begin{array}{r} 2y - 4 = 16 \quad 2y - 4 = -16 \\ +4 \quad +4 \quad +4 \quad +4 \\ \hline 2y = 20 \quad 2y = -12 \\ \frac{2y}{2} = \frac{20}{2} \quad \frac{2y}{2} = \frac{-12}{2} \\ y = 10 \quad y = -6 \\ y = \{-6, 10\} \end{array}$$

$$(23) |5y+10| - 8 = -10$$

$$\begin{array}{r} |5y+10| = -2 \\ \emptyset, \text{no solution, } \{\text{empty set}\} \end{array}$$

$$(24) \text{solve for } y$$

$$x + 9y = 5$$

$$\begin{array}{r} 9y = 5 - x \\ \frac{9y}{9} = \frac{5-x}{9} \\ y = \frac{5-x}{9} \end{array}$$

$$(25) \text{solve for } y$$

$$Bz = \frac{y-x}{z} \cdot z$$

$$Bz = \frac{y-x}{z} \cdot z$$

$$Bz + x = y$$

$$(26) \text{solve for } x$$

$$xy + 9 = n$$

$$\begin{array}{r} xy + 9 = n \\ -9 \quad -9 \\ \hline xy = n - 9 \\ \frac{xy}{x} = \frac{n-9}{x} \\ y = \frac{n-9}{x} \end{array}$$

$$(27) 2(3y+4) = 2(4y-10)$$

$$\begin{array}{r} 6y + 8 = 8y - 20 \\ -8y \quad -8y \\ \hline -2y + 8 = -20 \\ -8 \quad -8 \\ \hline -2y = -28 \\ \frac{-2y}{-2} = \frac{-28}{-2} \\ y = 14 \end{array}$$

(28) Sam's Phone Company charges \$75 plus \$.50 per minute. Randy's Phone Company charges \$100 plus \$.25 per minute. For what number of minutes would the companies charges be the same?

$$\begin{array}{r} \text{Sam} \quad \text{Randy} \\ 75 + .50m = 100 + .25m \\ - .25m \quad - .25m \\ \hline 75 + .25m = 100 \\ -75 \quad -75 \\ \hline .25m = 25 \end{array}$$

$$\begin{array}{r} .25m = 25 \\ \frac{.25m}{.25} = \frac{25}{.25} \\ m = 100 \end{array}$$

They will be the same at 100 minutes

(29) If you use 50 minutes, which company is cheaper?

$$\begin{array}{r} \text{Sam} \quad \text{Randy} \\ 75 + .50(50) \quad 100 + .25(50) \\ \$100 \quad \$112.50 \end{array}$$

At 50 minutes Sam's Phone Company is cheaper

(30) If you use 200 minutes, which company is cheaper?

$$\begin{array}{r} \text{Sam} \quad \text{Randy} \\ 75 + .50(200) \quad 100 + .25(200) \\ \$175 \quad \$150 \end{array}$$

At 200 minutes Randy's phone company is cheaper