

Name _____

8A; Algebra 1

Date _____

Period _____

Review for Systems of Equations

I. Solve each system of equations algebraically and check.

1) $5x - 2y = 22$
 $x + 2y = 2$

2) $3x - 5y = -6$
 $2x - 3y = -5$

3) $3x + 2y = 4$
 $-2x + 2y = 24$

4) $5a + 3b = 17$
 $4a - 5b = 21$

II. Solve each system of equations algebraically and check.

$$\begin{aligned} 5) \quad x + 2y &= 7 \\ x &= y - 8 \end{aligned}$$

$$\begin{aligned} 6) \quad 3r + 2s &= 20 \\ r &= -2s \end{aligned}$$

$$\begin{aligned} 7) \quad y &= x + 4 \\ x + y &= 2 \end{aligned}$$

$$\begin{aligned} 8) \quad x + y &= 8 \\ y &= x - 3 \end{aligned}$$

III. In 9 - 14: Solve using Legend, Equation, Solution, and Check.

9) The sum of two numbers is 150. The larger number is 30 more than the smaller number. Find both numbers.

10) At a store, 3 notebooks and 2 pencils cost \$2.80. At the same price, 2 notebooks and 5 pencils cost \$2.60. Find the cost of one notebook and one pencil.

11) On the first day that tickets to the school play were sold, 100 tickets were sold for \$230. Regular tickets cost \$3 and student tickets cost \$2. How many of each kind of ticket were sold?

12) At a fast-food restaurant, a family bought 4 hamburgers and 3 bags of French fries for \$4.20. At the same time, a family traveling with them bought 5 hamburgers and 2 bags of French fries for \$4.55. What was the cost of one hamburger and what was the cost of one bag of French fries?

13) The owner of a go-cart track was counting the money from 1 day's ticket sales. He knew that a total of 168 tickets were sold. Adult tickets cost \$7.50 each and children's tickets cost \$4.75 each. If the total receipts for the day were \$996.00 how many of each type of ticket were sold?

14) David bought 3 shirts of equal value and 6 ties of equal value at a store and paid \$120. At the same store, Tom bought 2 of the same shirts and 5 of the same ties and paid \$90. What was the price of each shirt and tie?

Review for Systems of Equations

I. Solve each system of equations algebraically and check.

1) $\begin{cases} 5x - 2y = 22 \\ x + 2y = 2 \end{cases} \rightarrow \begin{cases} 5x - 2y = 22 \\ -5x - 10y = -10 \end{cases}$

$$\begin{array}{r} -12y = 12 \\ -12 \quad -12 \\ \hline y = -1 \end{array}$$

$(4, -1)$

$$5x - 2y = 22$$

$$5x - 2(-1) = 22$$

$$\begin{array}{r} 5x + 2 = 22 \\ -2 \quad -2 \\ \hline 5x = 20 \\ \frac{5x}{5} = \frac{20}{5} \\ x = 4 \end{array}$$

Check #1

$(4, -1)$
x y
 $5x - 2y = 22$
 $5(4) - 2(-1) = 22$
 $20 + 2 = 22$
 $22 = 22$ ✓

Check #2

$(4, -1)$
x y
 $x + 2y = 2$
 $4 + 2(-1) = 2$
 $4 - 2 = 2$
 $2 = 2$ ✓

2) $\begin{cases} 3x - 5y = -6 \\ 2x - 3y = -5 \end{cases} \rightarrow \begin{cases} 6x - 10y = -12 \\ -6x + 9y = 15 \end{cases}$

$$\begin{array}{r} -1y = 3 \\ -1 \quad -1 \\ \hline y = -3 \end{array}$$

$(-7, -3)$

$$3x - 5y = -6$$

$$3x - 5(-3) = -6$$

$$\begin{array}{r} 3x + 15 = -6 \\ -15 \quad -15 \\ \hline 3x = -21 \\ \frac{3x}{3} = \frac{-21}{3} \\ x = -7 \end{array}$$

Check #1

$(-7, -3)$
x y
 $3x - 5y = -6$
 $3(-7) - 5(-3) = -6$
 $-21 + 15 = -6$
 $-6 = -6$ ✓

Check #2

$(-7, -3)$
x y
 $2x - 3y = -5$
 $2(-7) - 3(-3) = -5$
 $-14 + 9 = -5$
 $-5 = -5$ ✓

3) $\begin{cases} 3x + 2y = 4 \\ -2x + 2y = 24 \end{cases} \rightarrow \begin{cases} 6x + 4y = 8 \\ -6x + 6y = 72 \end{cases}$

$$\begin{array}{r} 10y = 80 \\ 10 \quad 10 \\ \hline y = 8 \end{array}$$

$(-4, 8)$

$$3x + 2y = 4$$

$$3x + 2(8) = 4$$

$$\begin{array}{r} 3x + 16 = 4 \\ -16 \quad -16 \\ \hline 3x = -12 \\ \frac{3x}{3} = \frac{-12}{3} \\ x = -4 \end{array}$$

Check #1

$(-4, 8)$
x y
 $3x + 2y = 4$
 $3(-4) + 2(8) = 4$
 $-12 + 16 = 4$
 $4 = 4$ ✓

Check #2

$(-4, 8)$
x y
 $-2x + 2y = 24$
 $-2(-4) + 2(8) = 24$
 $8 + 16 = 24$
 $24 = 24$ ✓

4) $\begin{cases} 5a + 3b = 17 \\ 4a - 5b = 21 \end{cases} \rightarrow \begin{cases} 20a + 12b = 68 \\ -5(4a - 5b) = -105 \end{cases}$

$$\begin{array}{r} 37b = -37 \\ 37 \quad 37 \\ \hline b = -1 \end{array}$$

$(4, -1)$

$$5a + 3b = 17$$

$$5a + 3(-1) = 17$$

$$\begin{array}{r} 5a - 3 = 17 \\ +3 \quad +3 \\ \hline 5a = 20 \\ \frac{5a}{5} = \frac{20}{5} \\ a = 4 \end{array}$$

Check #1

$(4, -1)$
a b
 $5a + 3b = 17$
 $5(4) + 3(-1) = 17$
 $20 - 3 = 17$
 $17 = 17$ ✓

Check #2

$(4, -1)$
a b
 $4a - 5b = 21$
 $4(4) - 5(-1) = 21$
 $16 + 5 = 21$
 $21 = 21$ ✓

II. Solve each system of equations algebraically and check.

<p>5) $x + 2y = 7$ $x = (y - 8)$</p> <p>$x + 2y = 7$ $(y - 8) + 2y = 7$ $y - 8 + 2y = 7$ $3y - 8 = 7$ $+8 \quad +8$ $3y = 15$ $\frac{3y}{3} = \frac{15}{3}$ $y = 5$</p>	<p>$x = y - 8$ $x = 5 - 8$ $x = -3$</p> <p>$(-3, 5)$</p>	<p>Check #1 $(-3, 5)$ $x \quad y$ $x + 2y = 7$ $-3 + 2(5) = 7$ $-3 + 10 = 7$ $7 = 7$</p>	<p>Check #2 $(-3, 5)$ $x \quad y$ $x = y - 8$ $-3 = 5 - 8$ $-3 = -3$</p>
<p>6) $3r + 2s = 20$ $r = -2s$</p> <p>$3r + 2s = 20$ $3(-2s) + 2s = 20$ $-6s + 2s = 20$ $-4s = 20$ $\frac{-4s}{-4} = \frac{20}{-4}$ $s = -5$</p>	<p>$r = -2s$ $r = -2(-5)$ $r = 10$</p> <p>$(10, -5)$</p>	<p>Check #1 $(10, -5)$ $r \quad s$ $3r + 2s = 20$ $3(10) + 2(-5) = 20$ $30 - 10 = 20$ $20 = 20$</p>	<p>Check #2 $(10, -5)$ $r \quad s$ $r = -2s$ $10 = -2(-5)$ $10 = 10$</p>
<p>7) $y = (x + 4)$ $x + y = 2$</p> <p>$x + y = 2$ $x + (x + 4) = 2$ $x + x + 4 = 2$ $2x + 4 = 2$ $-4 \quad -4$ $2x = -2$ $\frac{2x}{2} = \frac{-2}{2}$ $x = -1$</p>	<p>$y = x + 4$ $y = (-1) + 4$ $y = -1 + 4$ $y = 3$</p> <p>$(-1, 3)$</p>	<p>Check #1 $(-1, 3)$ $x \quad y$ $y = x + 4$ $3 = (-1) + 4$ $3 = -1 + 4$ $3 = 3$</p>	<p>Check #2 $(-1, 3)$ $x \quad y$ $x + y = 2$ $-1 + 3 = 2$ $-1 + 3 = 2$ $2 = 2$</p>
<p>8) $x + y = 8$ $y = (x - 3)$</p> <p>$x + y = 8$ $x + (x - 3) = 8$ $x + x - 3 = 8$ $2x - 3 = 8$ $+3 \quad +3$ $2x = 11$ $\frac{2x}{2} = \frac{11}{2}$ $x = 5.5$</p>	<p>$y = x - 3$ $y = (5.5) - 3$ $y = 5.5 - 3$ $y = 2.5$</p> <p>$(5.5, 2.5)$</p>	<p>Check #1 $(5.5, 2.5)$ $x \quad y$ $x + y = 8$ $(5.5) + (2.5) = 8$ $5.5 + 2.5 = 8$ $8 = 8$</p>	<p>Check #2 $(5.5, 2.5)$ $x \quad y$ $y = x - 3$ $2.5 = (5.5) - 3$ $2.5 = 5.5 - 3$ $2.5 = 2.5$</p>

III. In 9 - 14: Solve using Legend, Equation, Solution, and Check.

9) The sum of two numbers is 150. The larger number ^x is 30 ^y more than the smaller number. Find both numbers.

L	E	S	C
Let $x =$ the larger # $y =$ the smaller #	$x + y = 150$ $x = 30 + y$ <hr/> $x + y = 150$ $30 + y + y = 150$ $30 + 2y = 150$ $\begin{array}{r} -30 \quad 30 \\ \hline 2y = 120 \\ \frac{2}{2} \quad \frac{2}{2} \\ y = 60 \end{array}$ $x = 30 + y$ $x = 30 + 60$ $x = 90$	the larger # is 90 and the smaller # is 60	$90 + 60 = 150$ <hr/> $30 + 60 = 90 \checkmark$

10) At a store, 3 notebooks and 2 pencils cost \$2.80. At the same price, 2 notebooks and 5 pencils cost \$2.60. Find the cost of one notebook and one pencil.

L	E	S	C
Let $x =$ the cost of 1 notebook $y =$ the cost of 1 pencil	$2(3x + 2y = 2.80) \rightarrow 6x + 4y = 5.60$ $-3(2x + 5y = 2.60) \rightarrow -6x - 15y = -7.80$ <hr/> $\begin{array}{r} -11y = -2.2 \\ -11 \quad -11 \\ \hline y = .2 \end{array}$ $3x + 2y = 2.80$ $3x + 2(.2) = 2.80$ $3x + .4 = 2.80$ $\begin{array}{r} -4 \quad -4 \\ \hline 3x = 2.4 \\ \frac{3}{3} \quad \frac{3}{3} \\ x = .8 \end{array}$	The cost of 1 notebook is \$.80 + the cost of 1 pencil is \$.20	$3(.80) = 2.40$ $2(.20) = .40$ <hr/> $2.80 \checkmark$ <hr/> $2(.80) = 1.60$ $5(.20) = 1.00$ <hr/> $2.60 \checkmark$

11) On the first day that tickets to the school play were sold, 100 tickets were sold for \$230. Regular tickets cost \$3 and student tickets cost \$2. How many of each kind of ticket were sold?

L	E	S	C
Let $x =$ the # of regular tickets sold $y =$ the # of student tickets sold	$3x + 2y = 230 \rightarrow 3x + 2y = 230$ $-3(x + y = 100) \rightarrow -3x - 3y = -300$ <hr/> $\begin{array}{r} -1y = -70 \\ -1 \quad -1 \\ \hline y = 70 \end{array}$ $x + y = 100$ $x + 70 = 100$ $\begin{array}{r} -70 \quad -70 \\ \hline x = 30 \end{array}$	there were 30 regular tickets sold + 70 student tickets sold	$30 + 70 = 100 \checkmark$ <hr/> $30(3) = 90$ $70(2) = 140$ <hr/> $230 \checkmark$

12) At a fast-food restaurant, a family bought 4 hamburgers and 3 bags of French fries for \$4.20. At the same time, a family traveling with them bought 5 hamburgers and 2 bags of French fries for \$4.55. What was the cost of one hamburger and what was the cost of one bag of French fries?

L	E	S	C
let $x =$ the cost of 1 hamburger $y =$ the cost of 1 bag of french fries	$5(4x + 3y = 4.20) \rightarrow 20x + 15y = 21$ $-4(5x + 2y = 4.55) \rightarrow -20x - 8y = -18.20$ <hr/> $7y = 2.8$ $\frac{7y}{7} = \frac{2.8}{7}$ $y = .40$ $4x + 3y = 4.20$ $4x + 3(.40) = 4.20$ $4x + 1.20 = 4.20$ $-1.20 \quad -1.20$ <hr/> $\frac{4x = 3}{4 \quad 4}$ $x = .75$	the cost of 1 hamburger is \$.75 and the cost of 1 bag of french fries is \$.40	$4(.75) = 3$ $3(.40) = 1.20$ <hr/> $4.20 \checkmark$ <hr/> $5(.75) = 3.75$ $2(.40) = .80$ <hr/> $4.55 \checkmark$

13) The owner of a go-cart track was counting the money from 1 day's ticket sales. He knew that a total of 168 tickets were sold. Adult tickets cost \$7.50 each and children's tickets cost \$4.75 each. If the total receipts for the day were \$996.00 how many of each type of ticket were sold?

L	E	S	C
let $x =$ the # of adult tickets $y =$ the # of children's tickets	$1(7.5x + 4.75y = 996) \rightarrow 7.5x + 4.75y = 996$ $-7.5(x + y = 168) \rightarrow -7.5x - 7.5y = -1260$ <hr/> $-2.75y = -264$ $\frac{-2.75y}{-2.75} = \frac{-264}{-2.75}$ $y = 96$ $x + y = 168$ $x + 96 = 168$ $-96 \quad -96$ <hr/> $x = 72$	There were 72 adult tickets sold and 96 children's tickets sold	$72(7.50) = 540$ $96(4.75) = 456$ <hr/> $996 \checkmark$ <hr/> $72 + 96 = 168 \checkmark$

14) David bought 3 shirts of equal value and 6 ties of equal value at a store and paid \$120. At the same store, Tom bought 2 of the same shirts and 5 of the same ties and paid \$90. What was the price of each shirt and tie?

L	E	S	C
let $x =$ the price of each shirt $y =$ the price of each tie	$2(3x + 6y = 120) \rightarrow 6x + 12y = 240$ $-3(2x + 5y = 90) \rightarrow -6x - 15y = -270$ <hr/> $-3y = -30$ $\frac{-3y}{-3} = \frac{-30}{-3}$ $y = 10$ $3x + 6y = 120$ $3x + 6(10) = 120$ $3x + 60 = 120$ $-60 \quad -60$ <hr/> $\frac{3x = 60}{3 \quad 3}$ $x = 20$	The price of 1 shirt is \$20 and the price of the tie is \$10	$3(20) = 60$ $6(10) = 60$ <hr/> $120 \checkmark$ <hr/> $2(20) = 40$ $5(10) = 50$ <hr/> $90 \checkmark$