

Name KEY

Review For Solving Systems Using Calculator Technology

Section 1: Solving systems by finding the point of intersection on a graph.

1) $3x - 4y = 7 \rightarrow -4y = -3x + 7$
 $y = \frac{3}{5}x - 1$ $y = \frac{3}{4}x - \frac{7}{4}$ Point of intersection (5, 2)

2) $5x - 3y = -17 \rightarrow -3y = -5x - 17$
 $y = \frac{1}{4}x + 8\frac{1}{2}$ $y = \frac{5}{3}x + \frac{17}{3}$ Point of intersection (2, 9)

3) $7x - y = 5$ $7x - 5 = y$
 $y = 6x - 4\frac{1}{2}$ Point of intersection (1/2, -1 1/2)

Section 2: Solving systems by using the reduced row echelon form of a matrix..

4) $y = x - 4$ $-x + y = -4$
 $2x - 5y = 2$ $2x - 5y = 2$ Pt of Intersection (6, 2)

5) $2x + 3y = 8$
 $3x + y = 5$ Pt of Intersection (1, 2)

6) $2x + 3y = 6$
 $x + 2y = 1$ Pt of Intersection (9, -4)

7) $y = 3x + 5$ $-3x + y = 5$
 $x + 2y = 1$ $x + 2y = 1$ Pt of Intersection (-1 2/7, 8/7)

Section 2 (Continued): Solving systems by using the reduced row echelon form of a matrix..

$$4x + 5y + 3z = 19$$

8) $2x + 3y - 4z = 6$
 $x + 6y - 4z = 19$

Point of intersection $(-1, 4, 1)$

$$2x + 3y + 4z = -9$$

9) $x - 5y - 3z = -14$
 $2x + 7y + 11z = -11$

Point of intersection $(-5, 3, -2)$

$$4x + 2y + 10z = -8$$

10) $6x - 4y + 5z = 8$
 $2x + 3y + 15z = -14$

Point of intersection $(\frac{1}{2}, -2, -\frac{3}{5})$

Section 3: Solving word problems using the reduced row echelon form of a matrix.

Problem 11. A stamp collection consists of 3¢, 8¢, and 13¢ stamps. The number of 8¢ stamps is three less than twice the number of 3¢ stamps. The number of 13¢ stamps is twice the number of 8¢ stamps. The total value of all the stamps is \$2.53. How many of each type stamp are in the collection?

Stamps	Amount # stamps	Value ¢	Total Value
Stamp A	x	3	$3x$
Stamp B	y	8	$8y$
Stamp C	z	13	$13z$
			253

$$3x + 8y + 13z = 253$$

$$-2x + y + 0z = -3$$

$$0x - 2y + z = 0$$

$$y = 2x - 3$$

$$z = 2y$$

<p>STAMP A = 5 STAMP B = 7 STAMP C = 14</p>

Problem 12. Two investments earn a total annual income of \$1745. One investment is in a 9.5% annual interest account and the other is in a 14% simple interest CD. The total amount invested is \$16,000. **How much is invested at each account?**

Accounts	p	r	t	I
Investment A	A	.095	1	.095A
Investment B	B	.14	1	.14B
Total	16,000			1745

$$A + B = 16000$$

$$.095A + .14B = 1745$$

ACCOUNT A = \$11,000
ACCOUNT B = \$5,000

Problem 13. A paddle boat leaves a dock and travels to an amusement park at an average speed of 24 mph. On the return trip, the paddle boat travels at an average speed of 18 mph due to the operators eating too many funnel cakes. The total time for the trip is 7 hours. **How far is the amusement park from the dock?**

Object	Rate mph	Time	Distance
Going	24	x	24x
Returning	18	y	18y
Total		7	

$$x + y = 7$$

$$24x - 18y = 0$$

DISTANCE
GOING = RETURNING
 $24x = 18y$

$$x = 3$$

$$y = 4$$

DISTANCE 24[3] }
OR
DISTANCE 18[4] }

DISTANCE = 72 MILES

Problem 14. Larry Stokes invested \$7200 for one year, part at 10% annual interest and the rest at 14% annual interest. His total interest for the year was \$960. **How much money did he invest at each rate?**

Accounts	p	r	t	I
Investment A	A	.10	1	.10A
Investment B	B	.14	1	.14B
Total	7200			960

$$A + B = 7200$$

$$.10A + .14B = 960$$

Account A = \$1,200
Account B = \$6,000

Problem 15. An account executive bought 300 stamps for \$73.80. The purchase included 15¢ stamps, 20¢ stamps, and 40¢ stamps. The number of 20¢ stamps is four times the number of 15¢ stamps. **How many 40¢ stamps were purchased?**

Stamps	Amount # stamps	Value ¢	Total Value
Stamp A	A	15	15A
Stamp B	B	20	20B
Stamp C	C	40	40C
Total	300		7380

$$A + B + C = 300$$

$$15A + 20B + 40C = 7380$$

$$-4A + B + 0C = 0$$

$$B = 4A$$

STAMP A = 44
STAMP B = 176
STAMP C = 80

STAMP C = 80

Problem 16. Consider a two digit number. The sum of the digits is 16. If the digits are reversed then the result will be a value that is decreased by 18. Find the two digit number.

TEN'S: x
ONE'S: y

$$x + y = 16$$

ORIGINAL #: $10x + y$
REVERSED #: $10y + x$

$$\text{ORIGINAL} = \text{REVERSED} + 18$$

$$10x + y = 10y + x + 18$$

$$9x - 9y = 18$$

$$\left. \begin{array}{l} x + y = 16 \\ 9x - 9y = 18 \end{array} \right\}$$

$$\left. \begin{array}{l} x = 9 \\ y = 7 \end{array} \right\}$$

NUMBER: 97

Problem 17. Consider a two digit number. The sum of the digits is 6. If the digits are reversed then the result will be a value that is increased by 6 less than twice the original number. Find the two digit number.

TEN'S: x
ONE'S: y

$$x + y = 6$$

ORIGINAL #: $10x + y$
REVERSED #: $10y + x$

$$\text{REVERSED} = 2[\text{ORIGINAL}] - 6$$

$$10y + x = 2[10x + y] - 6$$

$$10y + x = 20x + 2y - 6$$

$$-19x + 8y = -6$$

$$\left. \begin{array}{l} x + y = 6 \\ -19x + 8y = -6 \end{array} \right\}$$

$$\left. \begin{array}{l} x = 2 \\ y = 4 \end{array} \right\}$$

NUMBER: 24

Problem 18. A flower shop sold roses, violets, and daisies. A certain customer purchased a total of 310 flowers. Roses cost \$4.50, violets \$2.75, and daisies cost \$1.65. This customer had a bill that totaled \$916.50 before taxes. It was known the sum of the number of roses and violets sold to the customer was fifty less than twice the number of daisies sold, determine the number of each type of flower sold in the order.

	# FLOWERS	PRICE	TOTAL
ROSES	x	4.50	$4.50x$
VIOLETS	y	2.75	$2.75y$
DAISIES	z	1.65	$1.65z$
	310		916.50

$$\begin{aligned}
 x + y + z &= 310 \\
 4.50x + 2.75y + 1.65z &= 916.50 \\
 x + y - 2z &= -50
 \end{aligned}$$

<p>ROSES = 110 VIOLETS = 78 DAISIES = 120</p>

$$\begin{aligned}
 \text{VIOLETS} + \text{ROSES} &= 2[\text{DAISIES}] - 50 \\
 y + x &= 2z - 50 \\
 x + y - 2z &= -50
 \end{aligned}$$