Name_____

Quiz For Solving Systems Using Calculator Technology

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

1) $3x-5y=28$, $y=-\frac{2}{3}x+2$ — $y=\frac{3}{5}x-\frac{28}{5}$, $y=-\frac{2}{3}x+2$

Point of intersection (6, -2)

2) $2x+3y=-1$, $y=\frac{1}{4}x+7$ — $y=-\frac{2}{3}x-\frac{1}{3}$, $y=\frac{1}{4}x+7$

Point of intersection (-8, 5)

3) $2x-5y=-14$, $y=\frac{6}{7}x+2\frac{4}{7}$ — $y=\frac{2}{5}x+\frac{14}{5}$, $y=\frac{6}{7}x+2\frac{4}{7}$

Point of intersection (1/2, 3)

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

4) $4x-3y=-19$, $2x+y=3$

Pt of Intersection (-1, 5)

5) $x-4y=5$, $y=\frac{2}{3}x-3\frac{3}{4}$ — $x-4y=5$, $-\frac{2}{3}x+y=-3\frac{3}{4}$

Pt of Intersection (6, 1/4)

6) $x-3y=8$, $3x+4y=11$

Pt of Intersection (5, -1)

7) $2x+3y=-11$, $y=-\frac{1}{2}x-3$ — $2x+3y=-11$, $\frac{1}{2}x+y=-3$

Pt of Intersection (-4, -1)

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

8) $7x - 2y + 3z = -36$
$x + 5y + 8z = 7$
$4x - y - 6z = -44$

Point of intersection $(-7, -2, 3)$

9) $-6x + 8y - z = -26$
$3x + 4y + 8z = -6$
$2x + 6y + 3z = -1$

Point of intersection $(4, -\frac{1}{2}, -2)$

10) $2x + y + 3z = 19$
$4x + 2y - 7z = -14$
$11x + 4y + 8z = 66$

Point of intersection $(2, 3, 4)$

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

Problem 11. Some 12¢ balloons and some 18¢ balloons are mixed to make a package of 20 balloons. How many balloons of each kind are needed to make a package worth $3.06?

Balloons	Amount #	Value ¢	Total Value
Balloon A	x	18	$18x$
Balloons B	y	12	$12y$
	20		306

$x + y = 20$
$18x + 12y = 306$

Balloon A = 11
Balloon B = 9

Problem 12. Three investments earn a total annual income of $1260. One investment is in an 8% annual interest account. Another investment is in a low risk 5% simple interest CD, while the third is in a money share market that pays 3% annually. The total amount invested is $25,000. The amount that is invested at 8% is $11,000 less than twice the amount invested at 5%. **How much is invested at each account?**

Accounts	p	r	t	I
Investment A	x	.08	1	$.08x$
Investment B	y	.05	1	$.05y$
Investment C	z	.03	1	$.03z$
Total	25,000			1260

$x = 2y - 11000$

$x - 2y + 0z = -11,000$

$x + y + z = 25,000$

$.08x + .05y + .03z = 1260$

ACCOUNT A = $6,666.67
ACCOUNT B = $8,833.33
ACCOUNT C = $9,500

Problem 13. Two planes are 1380 miles apart and traveling toward each other. One plane traveling 80 mph faster than the other plane. The planes meet in 1.5 hours. Find the speed of each plane.

Object	Rate mph	Time	Distance
Plane A	x	1.5	$1.5x$
Plane B	y	1.5	$1.5y$
Total			1380

$x = y + 80$

$x - y = 80$

$1.5x + 1.5y = 1380$

PLANE A = 500 mph
PLANE B = 420 mph

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	x	.10	1	$.10x$
Investment B	y	.14	1	$.14y$
Total	7200			960

$x + y = 7200$

$.10x + .14y = 960$

Account A = $\$$ 1,200

Account B = $\$$ 6,000

Problem 15. 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. **Find the number of 3¢ stamps in the collection.**

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

$y = 2x - 3$ $\qquad z = 2y$

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

$0x - 2y + z = 0$

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

Stamp A = 5

Problem 16. Consider a two digit number. If the digits are reversed, then the result will be a value that is decreased by 27. It is also known that the original number is one less than three times the reversed value. Find the two digit number.

TEN'S: x

ONE'S: y

REPRESENT ORIGINAL: $10x+y$

REPRESENT REVERSE: $10y+x$

ORIGINAL = REVERSE $+27$

$10x+y = 10y+x+27$

$\boxed{9x-9y=27}$

ORIGINAL $= 3[\text{REVERSE}] - 1$

$10x+y = 3[10y+x]-1$

$10x+y = 30y+3x-1$

$\boxed{7x-29y=-1}$

$\boxed{\text{ORIGINAL} = 41}$

Problem 17. Consider the angles of a scalene triangle. The largest angle is 51 degrees less than three times the smallest. If the middle angle is **doubled**, it would be three degrees less than the sum of the smallest and largest angle. **Find the three angles.**

SMALLEST: x

MIDDLE: y

LARGEST: z

$z = 3x-51$ $\qquad 2y = x+z-3$

$-3x+0y+z=-51$

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

$x+y+z=180$

$\boxed{\begin{array}{l}\text{SMALLEST} = 43^\circ \\ \text{MIDDLE} = 59^\circ \\ \text{LARGEST} = 78^\circ\end{array}}$

Problem 18. A flower shop sold roses, violets, and daisies. A certain customer purchased a total of 192 flowers. Roses cost $5.25, violets $3.50, and daisies cost $1.80.
This customer had a bill that totaled $613.80 before taxes. It was known the sum of the number of daisies and violets sold to the customer was twelve more than twice the number of roses sold. **Determine the number of each type of flower sold in the order.**

Flowers	Amount #	Value $	Total Value
Roses	x	5.25	$5.25x$
Violets	y	3.50	$3.50y$
Daisies	z	1.80	$1.80z$
Total	192		613.80

$$z + y = 2x + 12$$
$$-2x + y + z = 12$$
$$x + y + z = 192$$
$$5.25x + 3.50y + 1.80z = 613.80$$

ROSES = 60
VIOLETS = 36
DAISIES = 96

Problem 19. At a certain party restaurant tokens can be purchased in different combinations for $25. If the following combinations are available. A customer can purchase 4 gold, 7 silver, and 15 bronze, or 8 gold, 5 silver, and 10 bronze, or 6 gold, 12 silver, and 5. **Determine the individual values of the tokens.**

GOLD: x
SILVER: y
BRONZE: z

$$4x + 7y + 15z = 25$$
$$8x + 5y + 10z = 25$$
$$6x + 12y + 5z = 25$$

GOLD: \$1.50
SILVER: \$1.00
BRONZE: \$.80