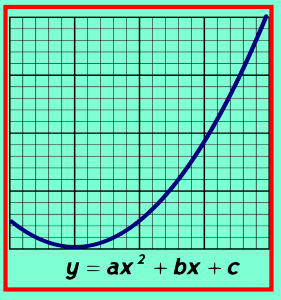
Math 125

Fall 2021

Lecture 25



Class QZ 20

Solve

Hint: use Addition Method

$$\begin{cases} 3x + 4y = 2 \\ 2x + 5y = -1 \end{cases}$$

-2 and 3

$$\Rightarrow \begin{cases} -6x - 8y = -4 \\ 6x + 15y = -3 \end{cases}$$

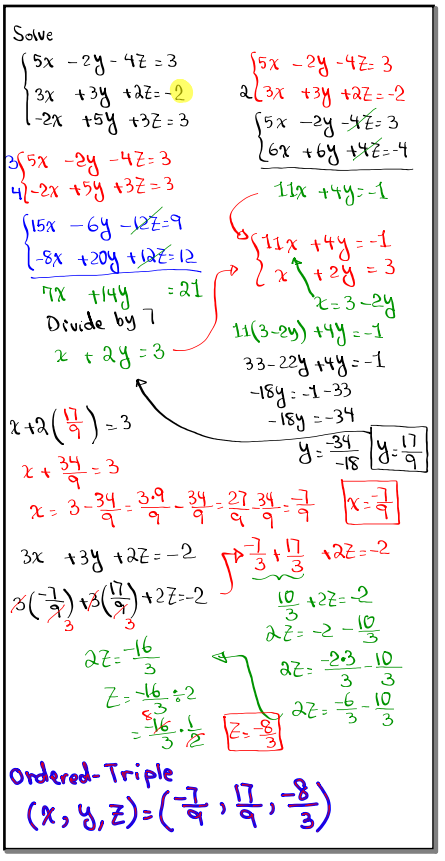
$7y = -7$ $\quad \boxed{y = -1}$ ✓

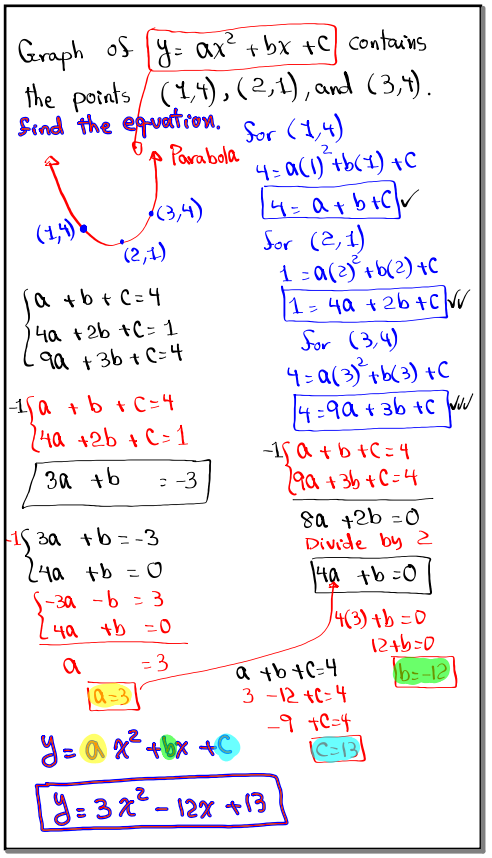
$2x + 5(-1) = -1$

$2x - 5 = -1$

$2x = 4$ $\quad \boxed{x = 2}$

Final Ans $(2, -1)$


Solve
5x − 2y − 4z = 3
3x + 3y + 2z = −2
−2x + 5y + 3z = 3
11x + 4y = −1
x + 2y = 3
x = 3 − 2y
Divide by 7
x + 2y = 3
Ordered-Triple
(x, y, z) = (−7/9, 17/9, −8/3)


Graph of y = ax² + bx + c contains the points (1,4), (2,1), and (3,4).
Find the equation.
Parabola
(1,4)
(2,1)
(3,4)
For (1,4)
4 = a + b + c
For (2,1)
1 = 4a + 2b + c
For (3,4)
4 = 9a + 3b + c
8a + 2b = 0
Divide by 2
4a + b = 0
a = 3
b = −12
c = 13
y = ax² + bx + c
y = 3x² − 12x + 13

Sam has 17 coins.

She has 73¢

Pennies, Nickels, and Dimes only.

# of dimes is 1 fewer than # of nickels.

How many of each?

P → # of Pennies
N → # of Nickels
D → # of Dimes

$$\begin{cases} P+N+D=17 \\ 1P+5N+10D=73 \\ D=N-1 \end{cases}$$

$$\begin{cases} P+N+D=17 \\ P+5N+10D=73 \\ -N+D=-1 \end{cases}$$

$$-1\begin{cases} P+N+D=17 \\ P+5N+10D=73 \end{cases}$$

$$4\begin{cases} -N+D=-1 \\ 4N+9D=56 \end{cases} \Rightarrow \begin{cases} -4N+4D=-4 \\ 4N+9D=56 \end{cases}$$

$$13D=52$$

$$D=4$$

$$4N+9D=56$$

$$-N+D=-1$$

$$-N+4=-1$$

$$-N=-5$$

$$N=5$$

$$P+N+D=17$$

$$P+5+4=17$$

$$P+9=17$$

$$P=8$$

8 pennies, 5 Nickels, 4 Dimes

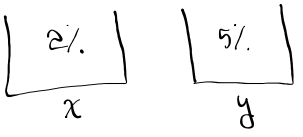
Jose has $8000.

He invested this money into two accounts.

One pays 2% and the other one pays 5% annual interest.

Interest from 5% account was $85 more than the interest from 2% account.

How much per account?



$$x+y=8000$$

$$5\%y=2\%x+85$$

Interest: $2\%x$ Interest: $5\%y$

$$100\begin{cases} x+y=8000 \\ -2\%x+5\%y=85 \end{cases} \Rightarrow \begin{cases} x+y=8000 \\ -2x+5y=8500 \end{cases}$$

$$7y=24500$$

$$y=3500$$

$$x+y=8000$$

$$x+3500=8000$$

$$x=4500$$

$4500 @ 2% Acct & $3500 @ 5% Acct

Maria has $10,000.

She opened up 3 accounts and earned $380 in simple interest after one year.

These accounts paid 2%, 3%, and 5% annual interest.

The amount she invested in 5% account was the same the total invested in the other 2 Accounts. How much per account?

$x \to \$$ in 2%.

$y \to \$$ in 3%.

$z \to \$$ in 5%.

$$\begin{cases} x + y + z = 10000 \\ 2\%x + 3\%y + 5\%z = 380 \\ z = x + y \end{cases}$$

$$\begin{cases} x + y + z = 10000 \\ 2x + 3y + 5z = 38000 \\ -x - y + z = 0 \end{cases}$$

$x + y + z = 10000$

$-x - y + z = 0$

$2z = 10000$

$z = 5000$

$$\begin{cases} x + y + 5000 = 10000 \\ 2x + 3y + 5(5000) = 38000 \end{cases}$$

$$\begin{cases} x + y = 5000 \\ 2x + 3y = 13000 \end{cases} \Rightarrow \begin{matrix} x = 2000 \\ y = 3000 \end{matrix}$$

$2000 @ 2%.

$3000 @ 3%.

$5000 @ 5%.

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

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

Find

$(f+g)(x) = f(x) + g(x) = 2x^2 - 5x + 3 + 2x^2 + 5x - 3$

$= 4x^2$

$(f-g)(x) = f(x) - g(x) = 2x^2 - 5x + 3 - (2x^2 + 5x - 3)$

$= 2x^2 - 5x + 3 - 2x^2 - 5x + 3$

$= -10x + 6$

Class QZ 21

Solve

$$\begin{cases} 4x = 2y + 6. \\ y = 2x + 4 \end{cases}$$

$4x = 2(2x + 4) + 6$

$4x = 4x + 8 + 6$

$4x - 4x = 14$

$0 = 14$

False

$\boxed{\emptyset}$