Warm-up

January 19, 2017

1. I will give you a cup of Skittles.
   DO NOT EAT UNTIL I SAY SO!!!

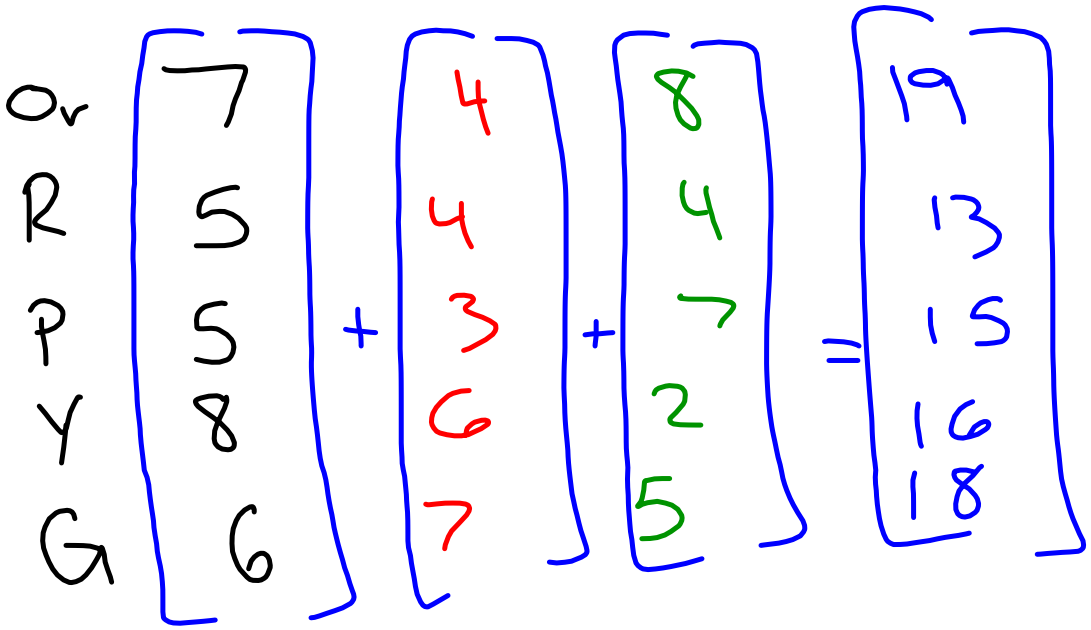
2. Sort the Skittles by color, and copy down the following questions as you answer them.

3. How many of each Skittle do you have?

4. If you combined your Skittles with a partner, how many of each would you now have?

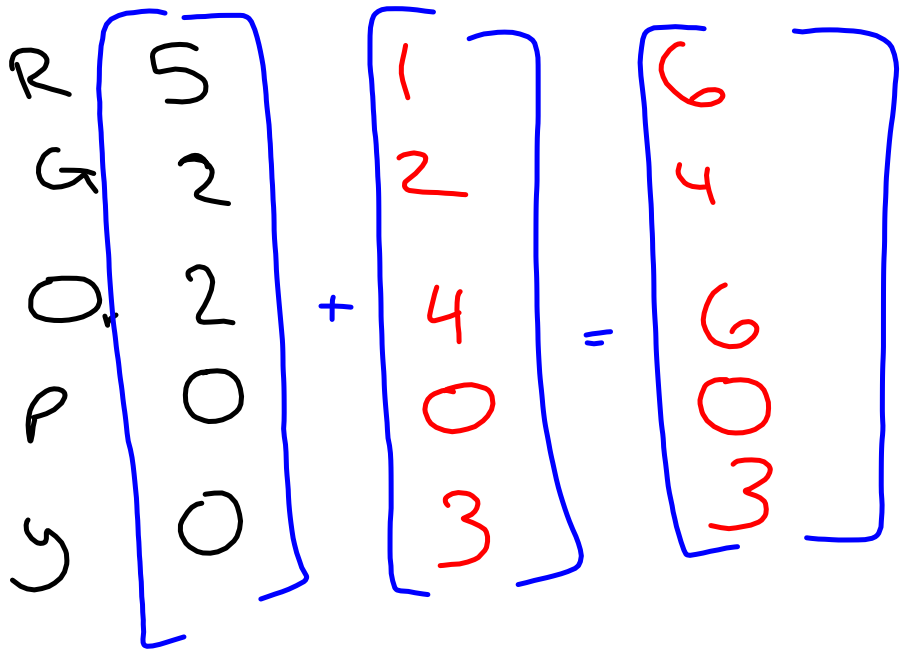
5. If you won the lottery and you now had 5 times the amount of each you had in the beginning, how many of each would you have?

6. Is there a more efficient way of calculating these answers?


Or
R
P
Y
G
7
5
5
8
6
+
4
4
3
6
7
+
8
4
7
2
5
=
19
13
15
16
18

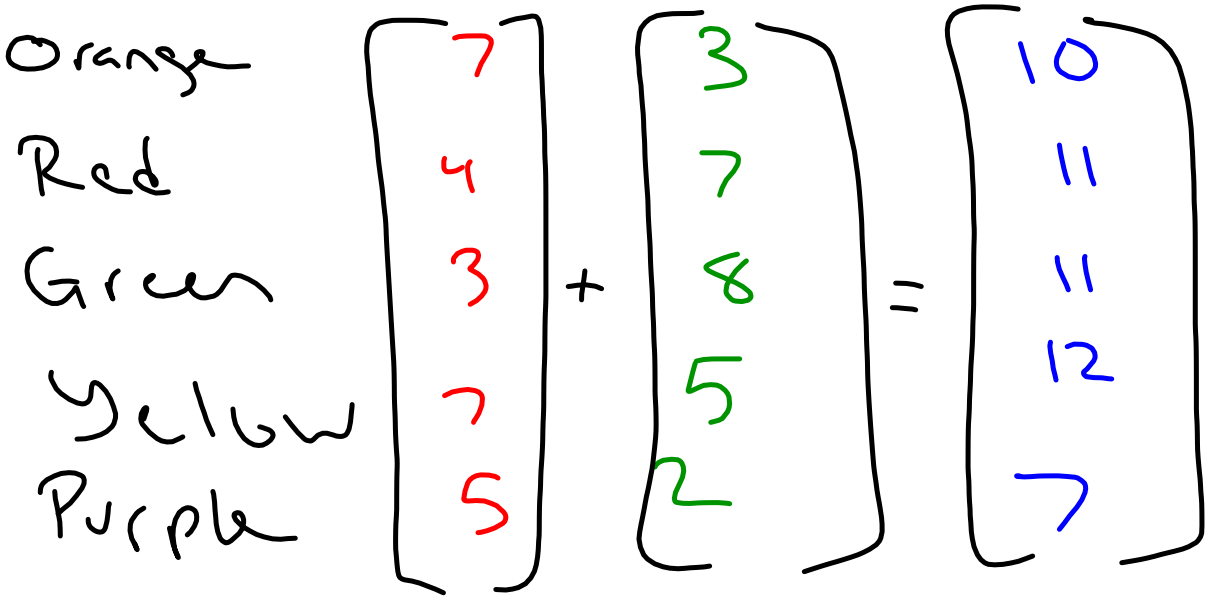
$$\begin{matrix} O \\ R \\ Y \\ P \\ G \end{matrix} \begin{bmatrix} 4 \\ 2 \\ 9 \\ 4 \\ 3 \end{bmatrix} + \begin{bmatrix} 8 \\ 2 \\ 6 \\ 3 \\ 0 \end{bmatrix} = \begin{bmatrix} 12 \\ 4 \\ 15 \\ 7 \\ 3 \end{bmatrix}$$

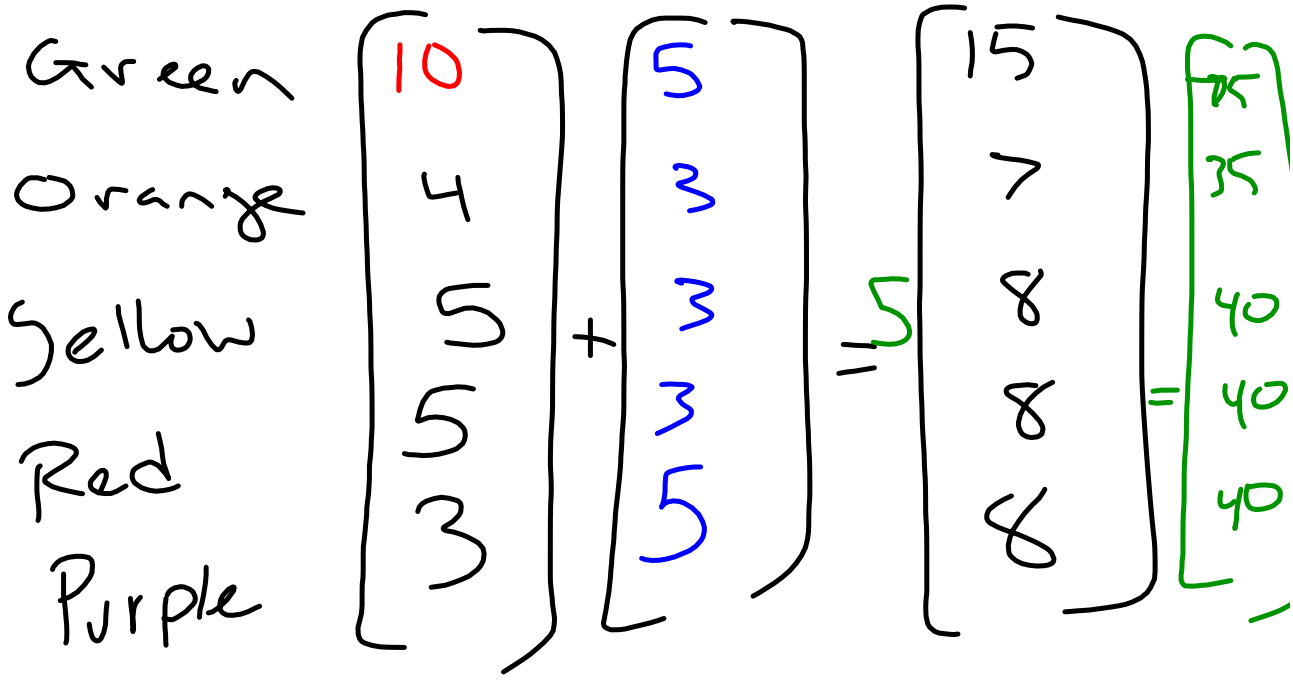
$$\begin{matrix} Or \\ R \\ Y \\ P \\ G \end{matrix} \quad 5\begin{bmatrix} 7 \\ 3 \\ 1 \\ 5 \\ 3 \end{bmatrix} = \begin{bmatrix} 35 \\ 15 \\ 5 \\ 25 \\ 15 \end{bmatrix}$$

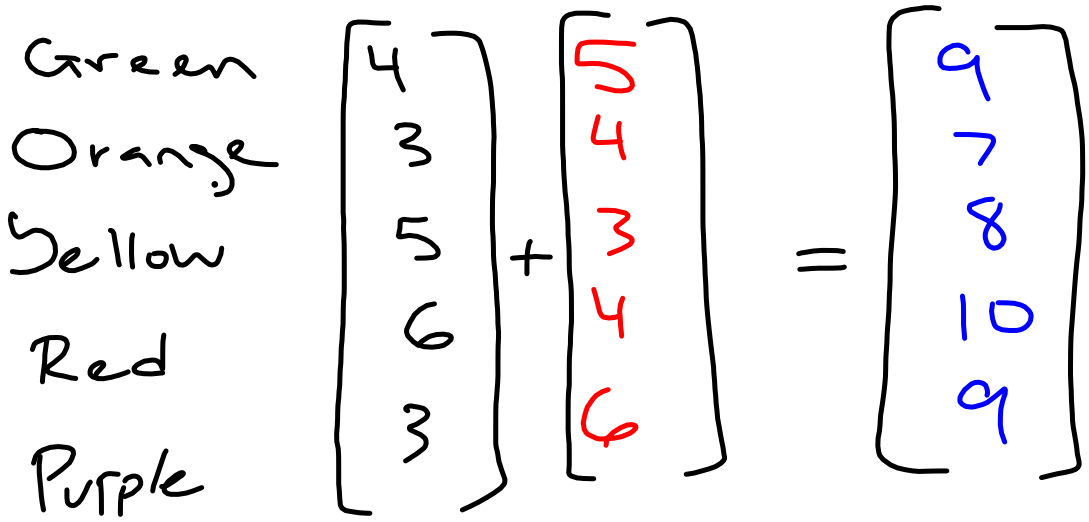

R
G
O
P
Y
5
2
2
0
0
+
1
2
4
0
3
=
6
4
6
0
3

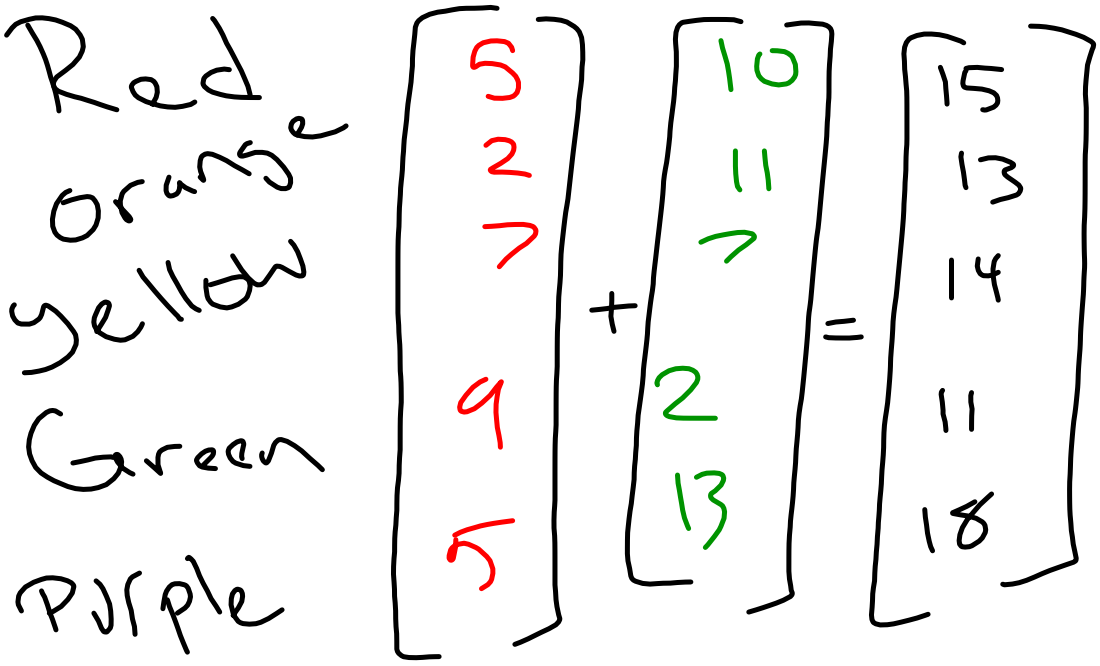
R
G
Or
P
Y

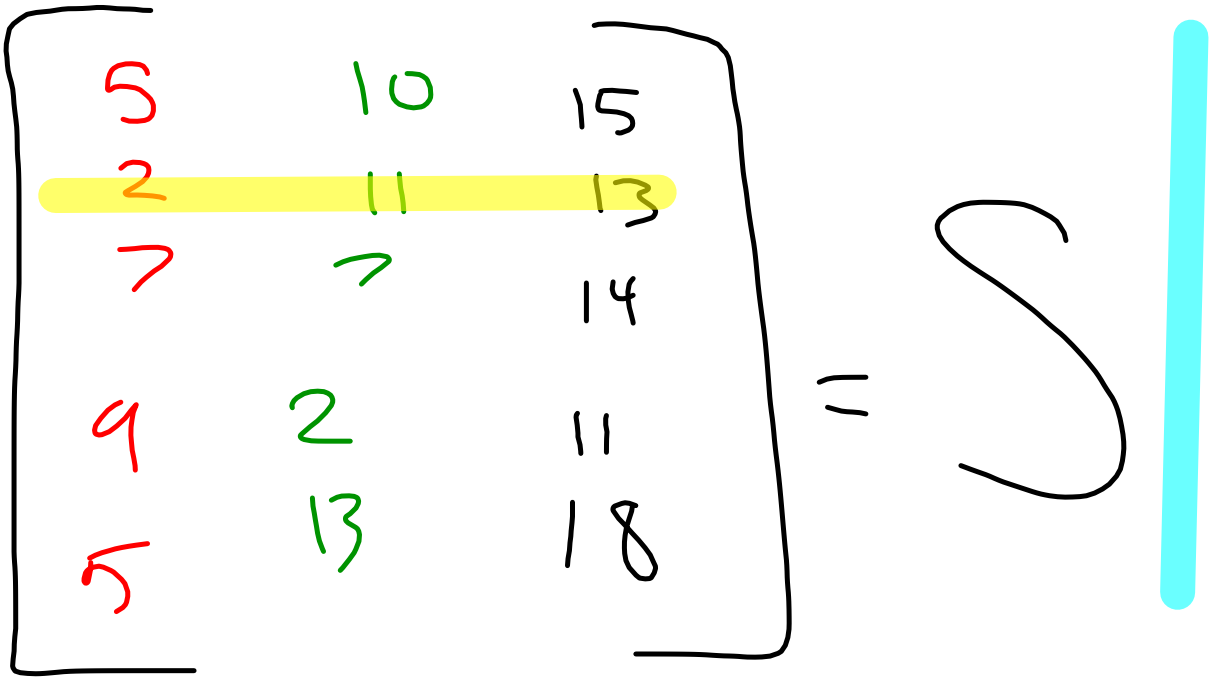
$$5\begin{bmatrix} 1 \\ 2 \\ 4 \\ 0 \\ 3 \end{bmatrix} = \begin{bmatrix} 5 \\ 10 \\ 20 \\ 0 \\ 15 \end{bmatrix}$$


Orange
Red
Green
Yellow
Purple
7
4
3
7
5
+
3
7
8
5
2
=
10
11
11
12
7


Green
Orange
Yellow
Red
Purple
10
4
5
5
3
+
5
3
3
3
5
=
5
15
7
8
8
8
=
75
35
40
40
40


Green
Orange
Yellow
Red
Purple
4
3
5
6
3
+
5
4
3
4
6
=
9
7
8
10
9

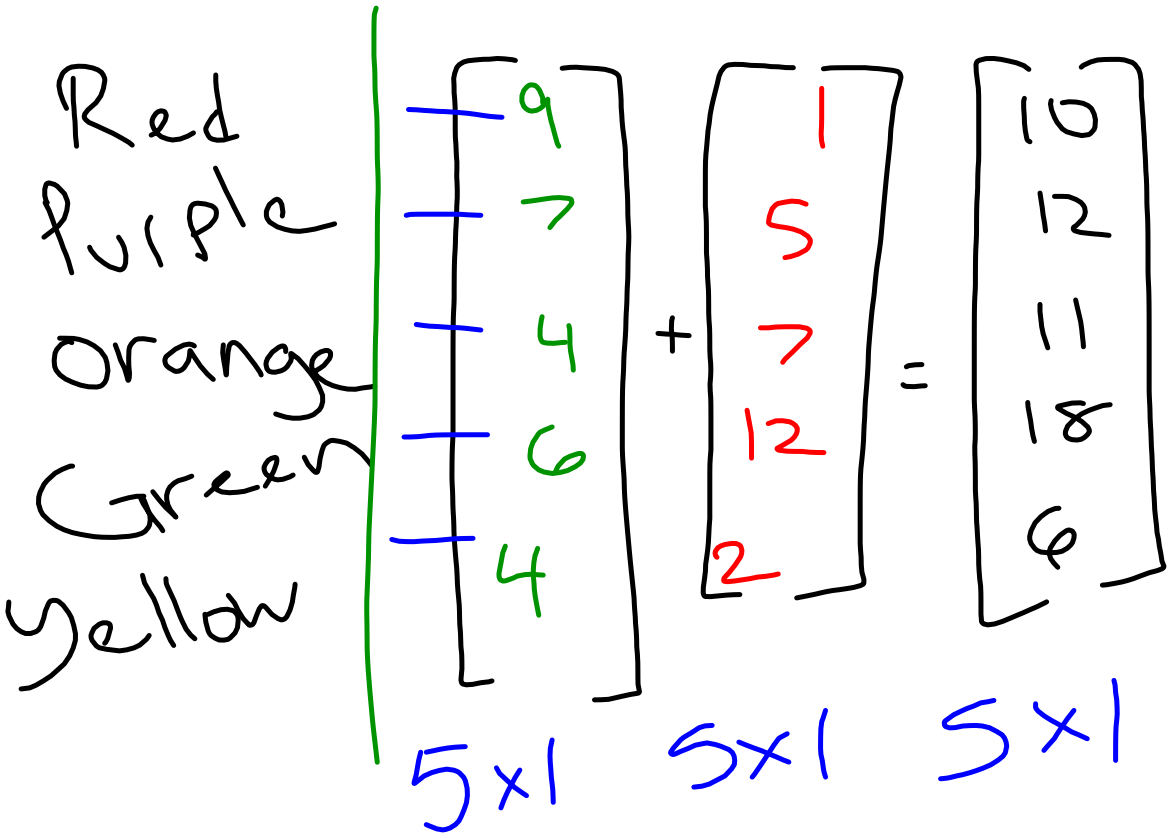

Red
orange
yellow
Green
Purple
5
2
7
9
5
+
10
11
7
2
13
=
15
13
14
11
18

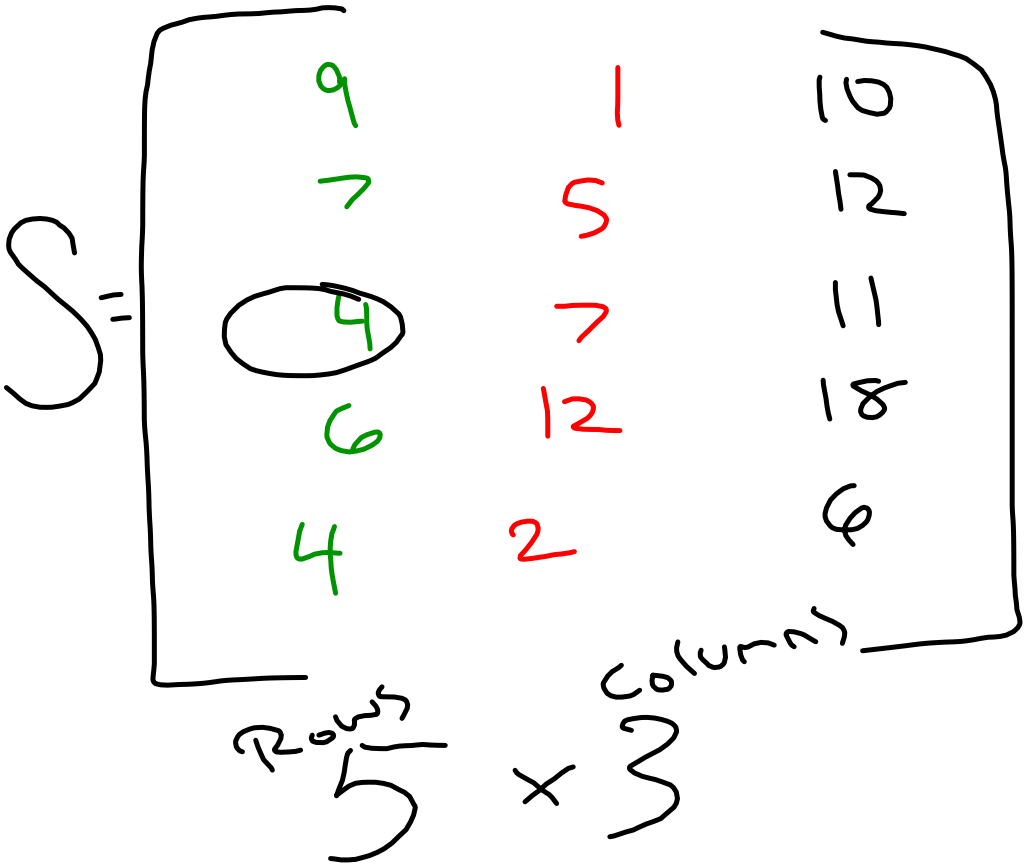


Rows x columns

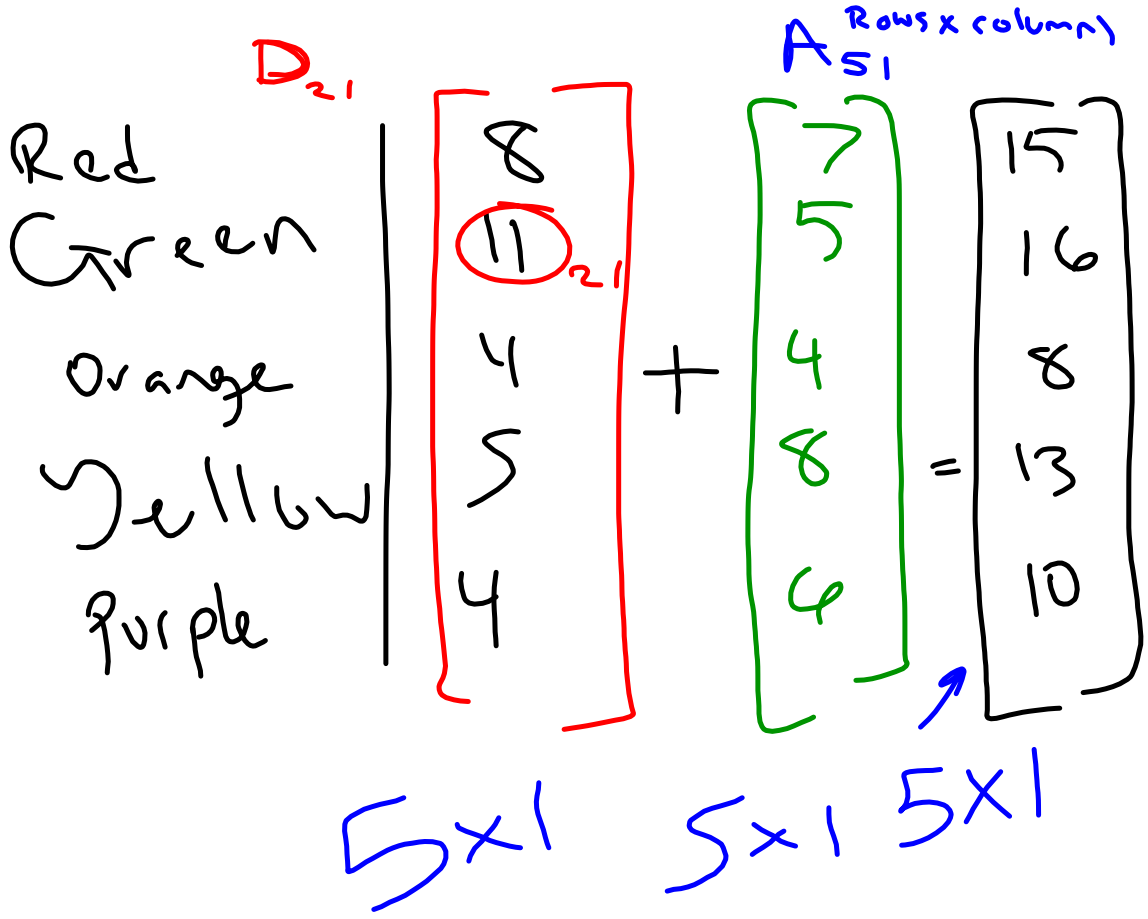
5 x 3

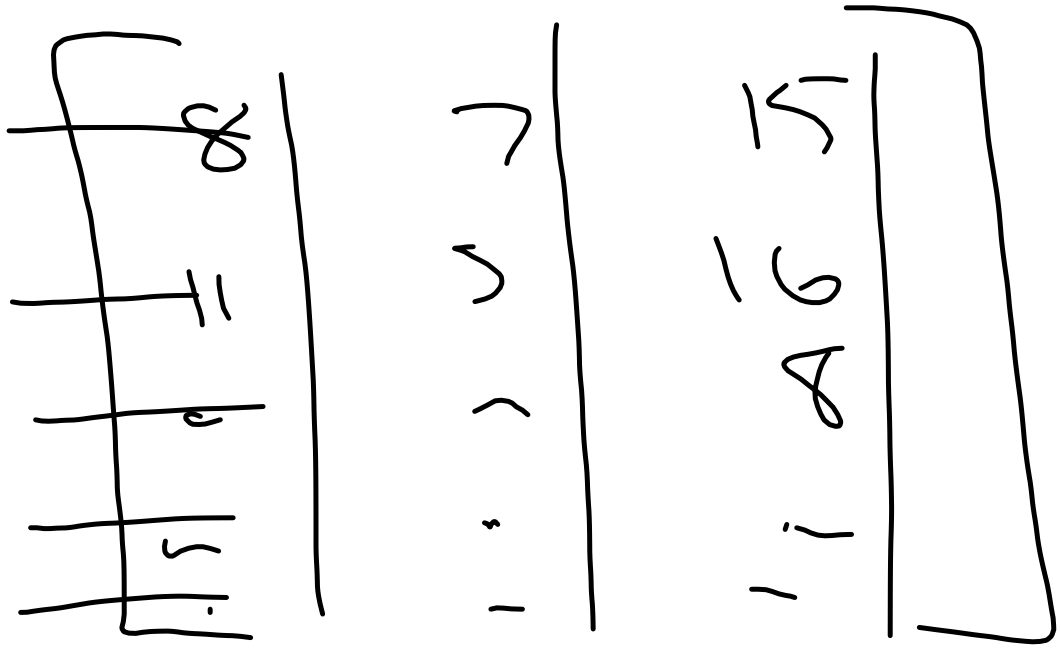
$S_{2,6}$ = undefined


Red
Purple
Orange
Green
Yellow
9
7
4
6
4
+
1
5
7
12
2
=
10
12
11
18
6
5x1
5x1
5x1



$S_{3,1} = 4$


Rows x columns
D_{21}
A_{51}
Red
Green
Orange
Yellow
Purple
8
11
4
5
4
+
7
5
4
8
6
=
15
16
8
13
10
5x1
5x1
5x1



5×3

$M_{52} = 6$

Determinant: the product of the elements on the main diagonal minus the product of the elements off the main diagonal

Dimensions or Order of a Matrix: the number of rows by the number of columns

Identity Matrix: the matrix that has 1's on the main diagonal and 0's elsewhere

Inverse Matrices: matrices whose product (in both orders) is the Identity matrix

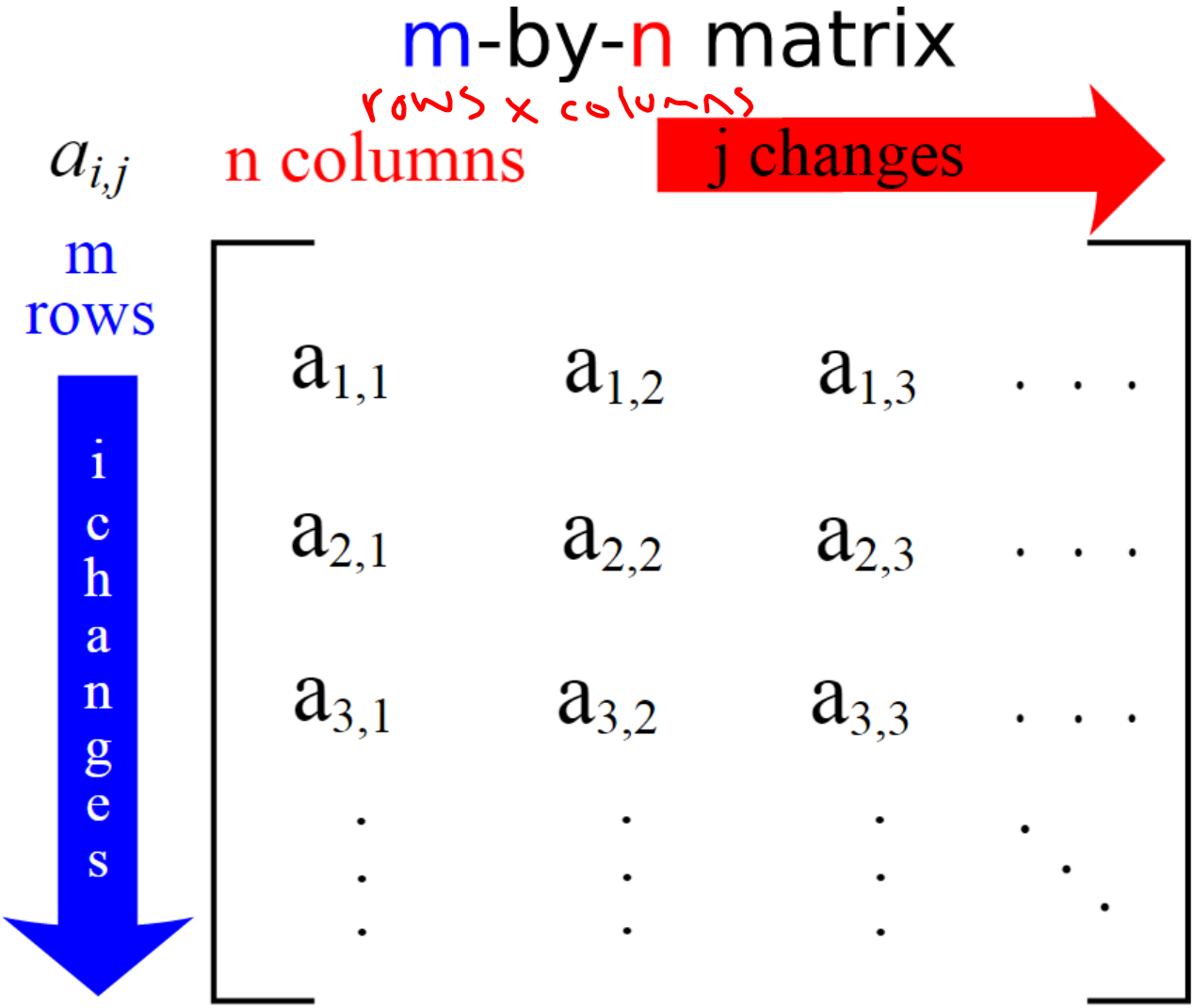
Matrix: a rectangular arrangement of numbers into rows and columns

Scalar: in matrix algebra, a real number is called a scalar

Square Matrix: a matrix with the same number of rows and columns

Zero Matrix: a matrix whose entries are all zeros

$\begin{bmatrix} 0 & 0 \end{bmatrix}$


m-by-n matrix
rows x columns
$a_{i,j}$
n columns
j changes
m
rows
i changes
$a_{1,1}$ $a_{1,2}$ $a_{1,3}$ . . .
$a_{2,1}$ $a_{2,2}$ $a_{2,3}$ . . .
$a_{3,1}$ $a_{3,2}$ $a_{3,3}$ . . .

$$\begin{bmatrix} 5 & 0 & -1 & 4 \\ 2 & 8 & -7 & 3 \end{bmatrix}$$

Dimension : $a_{2,4} = 3$

2×4

$$\begin{bmatrix} 3 & 5 & 8 \\ 1 & 6 & -7 \end{bmatrix} + \begin{bmatrix} 1 & 0 & 7 \\ 2 & 3 & 5 \end{bmatrix} = \begin{bmatrix} 4 & 5 & 15 \\ 3 & 9 & -2 \end{bmatrix}$$

$2 \times 3 \qquad 2 \times 3 \qquad 2 \times 3$

④ $\begin{bmatrix} 6 & 3 \\ 5 & -6 \\ 2 & 6 \\ 3 & -2 \end{bmatrix} - \begin{bmatrix} 3 & -1 \\ -3 & -5 \\ -1 & -6 \\ -3 & -2 \end{bmatrix} = \begin{bmatrix} 3 & 4 \\ 8 & -1 \\ 3 & 12 \\ 6 & 0 \end{bmatrix}$

$4 \times 2 \qquad 4 \times 2 \qquad 4 \times 2$

(9) $\begin{bmatrix} -2 & -3 & 3 \\ 0 & -1 & -2 \end{bmatrix} + \begin{bmatrix} -3 & 0 \\ -4 & 5 \\ 2 & 3 \\ 0 & -3 \end{bmatrix}$

2×3 4×2

undefined

$$\begin{bmatrix} 4 & 2 \\ 0 & 17 \\ 3 & -5 \end{bmatrix}$$

Dimension: 3×2

Add

$$\begin{bmatrix} 3 & 1 \\ 2 & -4 \end{bmatrix} + \begin{bmatrix} 5 & 6 \\ 7 & 0 \end{bmatrix} = \begin{bmatrix} 8 & 7 \\ 9 & -4 \end{bmatrix}$$

2×2 $\quad$ 2×2 $\quad$ 2×2

R C $\quad$ R C $\quad$ R C

$$\begin{bmatrix} 4 & 5 & 3 \end{bmatrix} + \begin{bmatrix} 6 & 9 & -2 \\ 1 & 5 & 4 \end{bmatrix} = \text{no solution undefined}$$

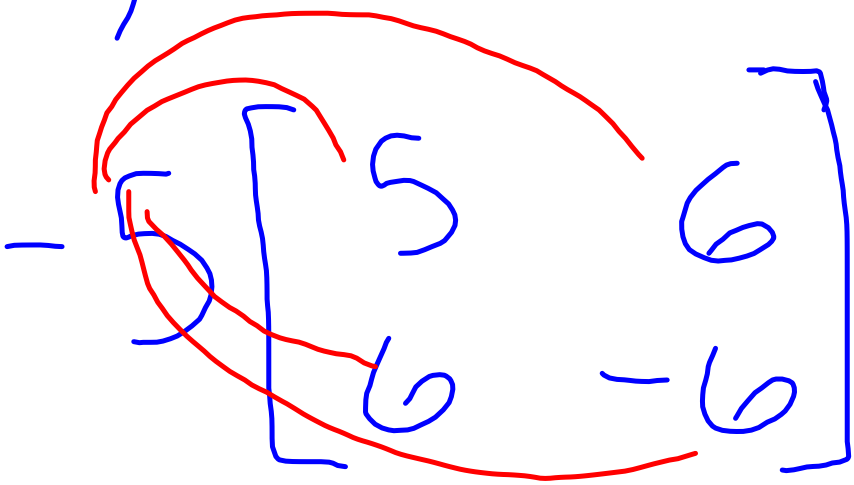
1×3 $\quad$ 2×3

Try #4.

$$\begin{bmatrix} 6 & 3 \\ 5 & -6 \\ 2 & 6 \\ 3 & -2 \end{bmatrix} - \begin{bmatrix} 3 & -1 \\ -3 & -5 \\ -1 & -6 \\ -3 & -2 \end{bmatrix} =$$

$$\begin{bmatrix} 3 & 4 \\ 8 & -1 \\ 3 & 12 \\ 6 & 0 \end{bmatrix}$$

10)



$$-5\begin{bmatrix} 5 & 6 \\ 6 & -6 \end{bmatrix}$$

$$\begin{bmatrix} -25 & -30 \\ -30 & 30 \end{bmatrix}$$

$$5\left(\begin{bmatrix} 3 & 2 \\ -3 & -6 \end{bmatrix} + \begin{bmatrix} 3 & 3 \\ 3 & -3 \end{bmatrix}\right)$$

$$5\left(\begin{bmatrix} 6 & 5 \\ 0 & -9 \end{bmatrix}\right) = \begin{bmatrix} 30 & 25 \\ 0 & -45 \end{bmatrix}$$

$$2\begin{bmatrix}1 & -3\end{bmatrix} - \begin{bmatrix}-2 & 1\end{bmatrix}$$

$$\begin{bmatrix}2 & -6\end{bmatrix} - \begin{bmatrix}-2 & 1\end{bmatrix}$$

$$\begin{bmatrix}4 & -7\end{bmatrix}$$

$$\begin{bmatrix} 5 & 6 \end{bmatrix} - 5\begin{bmatrix} 2 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 5 & 6 \end{bmatrix} - \begin{bmatrix} 10 & 5 \end{bmatrix}$$

$$\begin{bmatrix} -5 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 2 & 6 \\ x & 5 \end{bmatrix} + \begin{bmatrix} y & -1 \\ 3 & 0 \end{bmatrix} = \begin{bmatrix} 2 & 5 \\ 8 & 5 \end{bmatrix}$$

$2 + y = 2$

$-2 \quad -2$

$y = 0$

$x + 3 = 8$

$-3 \quad -3$

$x = 5$

$$2\begin{bmatrix} 4 & z \\ x & -1 \end{bmatrix} - \begin{bmatrix} y & -8 \\ 3 & -7 \end{bmatrix} = \begin{bmatrix} 2 & 6 \\ 13 & a \end{bmatrix}$$

Find $x, y, z, \& a$.

$x = 8$
$y = 6$
$z = -1$
$a = 5$

$-2-(-7) = a$
$-2+7 = a$
$5 = a$

$2z-(-8)=6$
$2z+8=6$
$-8-8$
$2z=-2$
$z=-1$

$$2Y - \begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 15 & 9 \end{bmatrix}$$

$$+ \begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix} + \begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix}$$

$$2Y = \begin{bmatrix} 14 & 15 \\ 18 & 2 \end{bmatrix}$$

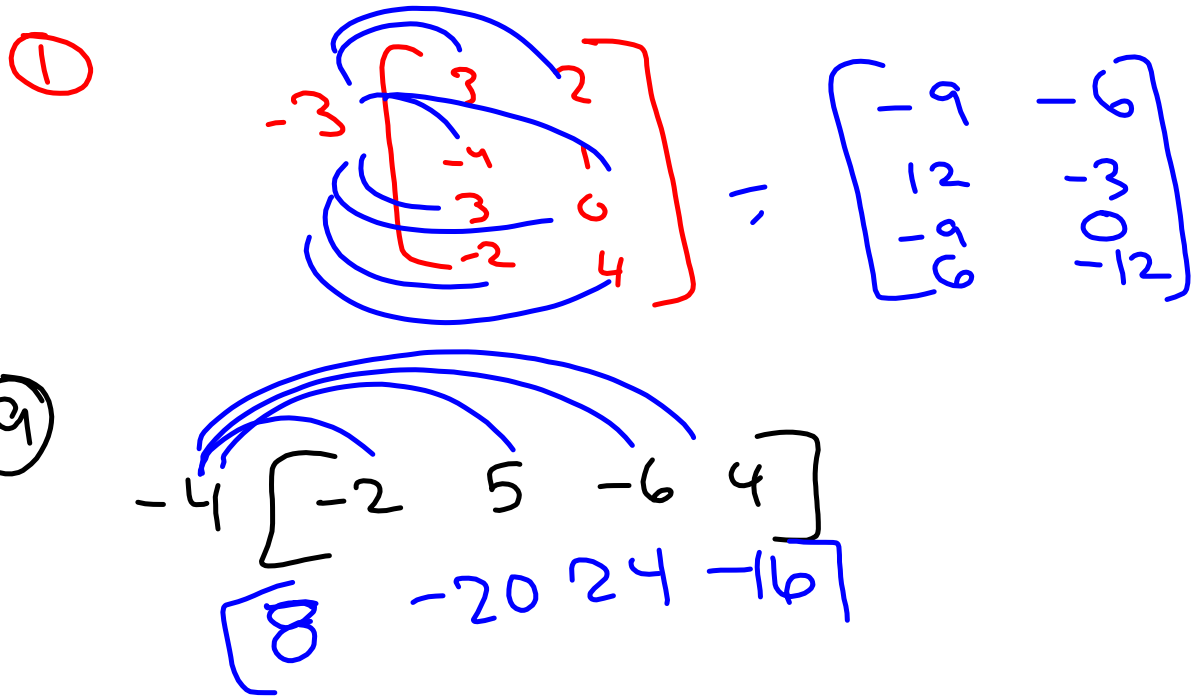
NO DIVISION

$\cdot \frac{1}{2}$

$$= \begin{bmatrix} 7 & \frac{15}{2} \\ 9 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 6 & 3 \\ 5 & -6 \\ 2 & 6 \\ 3 & -2 \end{bmatrix} - \begin{bmatrix} 3 & -1 \\ -3 & -5 \\ -1 & -6 \\ -3 & -2 \end{bmatrix} = \begin{bmatrix} 3 & 4 \\ 8 & -1 \\ 3 & 12 \\ 6 & 0 \end{bmatrix}$$

4×2 4×2 4×2

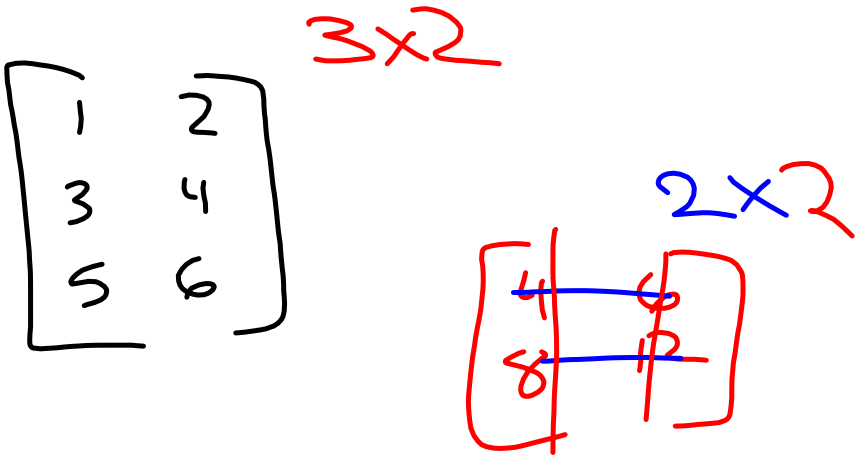

1
-3
3
2
-4
1
3
0
-2
4
=
-9
-6
12
-3
-9
0
6
-12

9
-4
-2
5
-6
4
8
-20
24
-16

7. Order your Skittles in a matrix with rows and columns. What is the dimension?

8. Create another matrix with dimensions.

9. Match your dimension with someone else's.


3x2
1 2
3 4
5 6
2x2

$$\begin{bmatrix} 1 & 5 \\ 2 & 2 \\ 3 & 4 \end{bmatrix} + \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix} = \begin{bmatrix} 2 & 7 \\ 5 & 6 \\ 8 & 10 \end{bmatrix}$$

3x2 3x2 3x2

$$\begin{bmatrix} 1 & 5 \\ 2 & 2 \\ 3 & 4 \end{bmatrix} + \begin{bmatrix} 1 \\ 3 \\ 5 \end{bmatrix} = \text{No solution}$$

"undefined"

3x2 3x1

$$\begin{bmatrix} 3 \\ 2 \\ 1 \end{bmatrix} + \begin{bmatrix} 5 \\ 6 \end{bmatrix} = \text{No Solution}$$

3×1 2×1

Add/subt. → SAME DIMENSIONS

1) $\begin{bmatrix} -4 & 1 \\ 6 & 3 \end{bmatrix} + \begin{bmatrix} -6 & -5 \\ -2 & -1 \end{bmatrix}$

2×2 2×2

$\begin{bmatrix} -10 & -4 \\ -8 & 2 \end{bmatrix}$

$$4 - 3 = 1$$

$$4 + (-3) = 1$$

$4 - 1(-3) = 7$

$4 + 3$

$4 + (-1 \cdot -3)$

$4 + 3$

(9) $\begin{bmatrix} -2 & -3 & 3 \\ 0 & -1 & -2 \end{bmatrix} + \begin{bmatrix} -3 & 0 \\ -4 & 5 \\ 2 & 3 \\ 0 & -3 \end{bmatrix}$ —

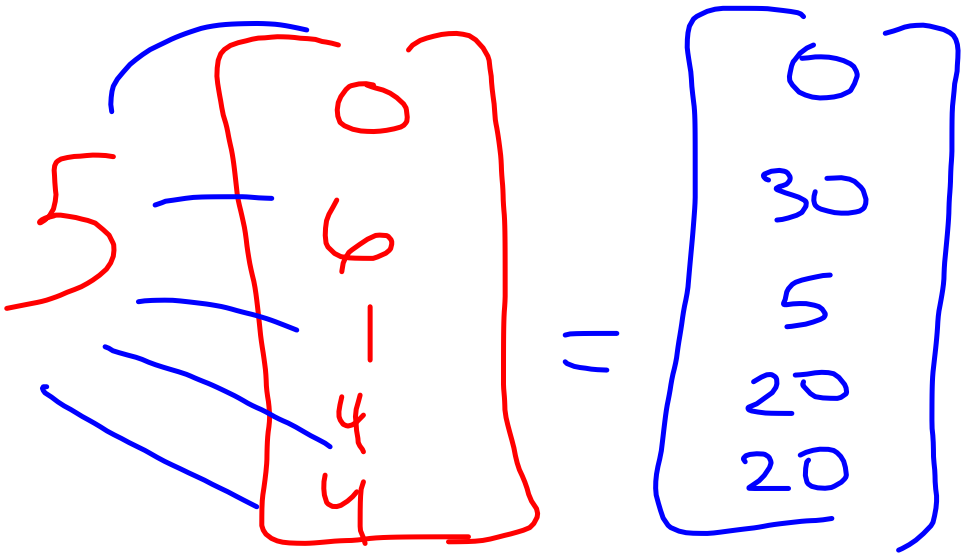
2×3

4×2

Not same dimensions

UNDEFINED

Scalar Multiplication



(6)

$$-2\begin{bmatrix} -6 & 2 \\ 5 & 6 \\ -1 & 1 \end{bmatrix} =$$

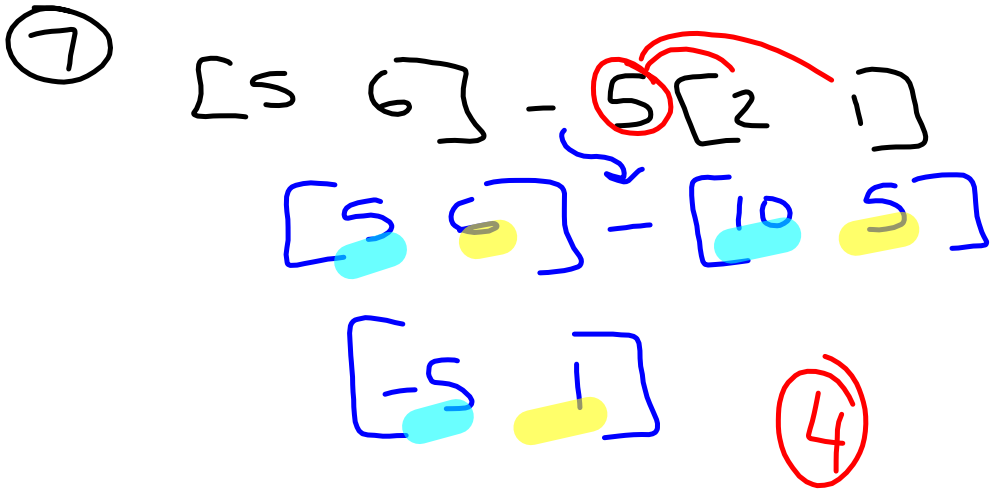
Simplify

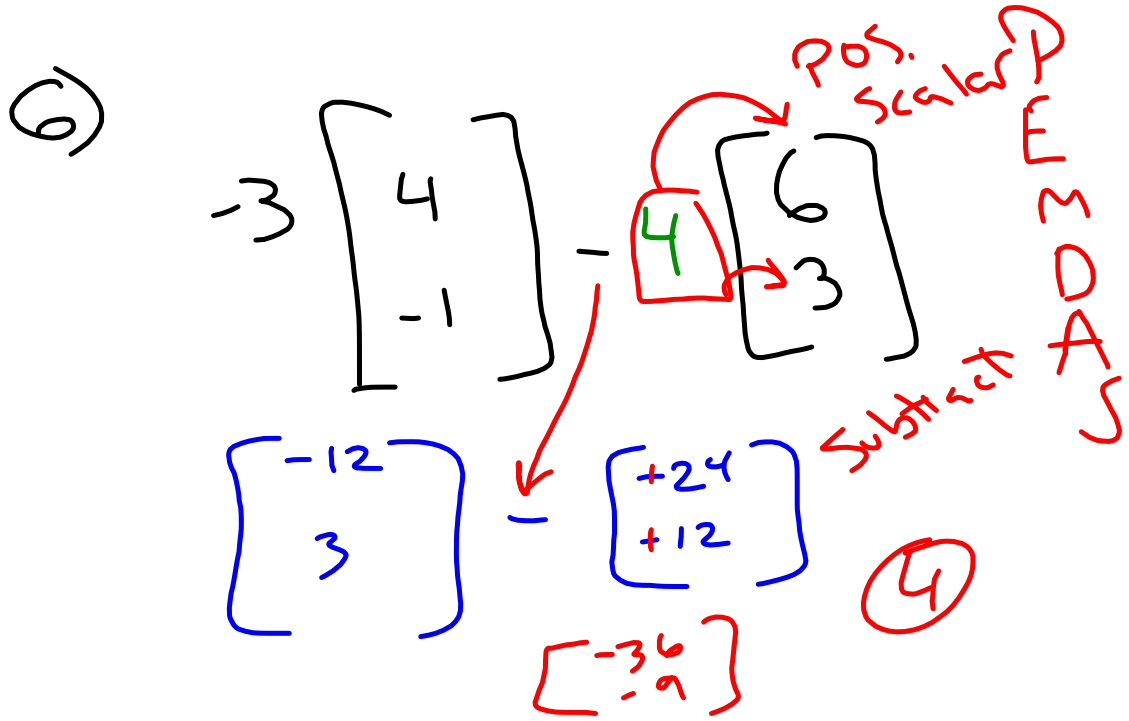
PEMDAS

① $5\left(\begin{bmatrix} 3 & 2 \\ -3 & -6 \end{bmatrix} + \begin{bmatrix} 3 & 3 \\ 3 & -3 \end{bmatrix}\right)$

$5\begin{bmatrix} 6 & 5 \\ 0 & -9 \end{bmatrix}$

$\begin{bmatrix} 30 & 25 \\ 0 & -45 \end{bmatrix}$


7
[5 6] - 5[2 1]
[5 6] - [10 5]
[-5 1]
4


6)
-3
4
-1
-
4
6
3
Pos. Scalar
PEMDAS
Subtract
-12
3
-
+24
+12
4
-36
-9

Solve

$$\begin{bmatrix} 2 & 6 \\ x & 5 \end{bmatrix} + \begin{bmatrix} y & -1 \\ 3 & 0 \end{bmatrix} = \begin{bmatrix} 2 & 5 \\ 8 & 5 \end{bmatrix}$$

$2 + y = 2$

$-2 \quad\quad -2$

$y = 0$

$6 + -1 = 5$

$x + 3 = 8$

$-3 \quad\quad -3$

$x = 5$

$$2\begin{bmatrix} 4 & z \\ x & -1 \end{bmatrix} - \begin{bmatrix} y & -8 \\ 3 & -7 \end{bmatrix} = \begin{bmatrix} 2 & 6 \\ 13 & a \end{bmatrix}$$

$$2z - (-8) = 6$$

$$2z + 8 = 6$$

$$-8 \quad -8$$

$$\frac{2z}{2} = \frac{-2}{2}$$

$$z = -1$$

4.

$$2Y - \begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix} \vdots \begin{bmatrix} 5 & 7 \\ 15 & 9 \end{bmatrix}$$

ADD 3 EF

INVERSE

$$+\begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix} \quad \vdots \quad +\begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix}$$

$$\frac{1}{2}2Y = \frac{1}{2}\begin{bmatrix} 14 & 15 \\ 18 & 2 \end{bmatrix}$$

You CANNOT DIVIDE! Y

$$3\left(\begin{bmatrix}2 & 6\\ 5 & -1\end{bmatrix}-\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix}\right)+X=\begin{bmatrix}0 & 1\\ 2 & 0\end{bmatrix}$$

$$3\begin{bmatrix}1 & 4\\ 2 & -5\end{bmatrix}$$

$$\begin{bmatrix}3 & 12\\ 6 & -15\end{bmatrix}+X=\begin{bmatrix}0 & 1\\ 2 & 0\end{bmatrix}$$

$$-\begin{bmatrix}3 & 12\\ 6 & -15\end{bmatrix} \qquad -\begin{bmatrix}-3 & -12\\ 4 & -15\end{bmatrix}$$

$$X=\begin{bmatrix}-3 & -11\\ -4 & -15\end{bmatrix}$$

Add.

① $\begin{bmatrix} -4 & 1 \\ -6 & 3 \end{bmatrix} + \begin{bmatrix} -6 & -5 \\ -2 & -1 \end{bmatrix} = \begin{bmatrix} -10 & -4 \\ -8 & 2 \end{bmatrix}$

2×2 2×2 2×2

$\begin{bmatrix} -4 & 1 \\ -6 & 3 \end{bmatrix} + \begin{bmatrix} 3 & 1 & 4 \end{bmatrix} =$ undefined

2×2 1×3

Multiply by a scalar.

① $-3\begin{bmatrix} 3 & 2 \\ -4 & 1 \\ 3 & 0 \\ -2 & 4 \end{bmatrix} = \begin{bmatrix} -9 & -6 \\ 12 & -3 \\ -9 & 0 \\ 6 & -12 \end{bmatrix}$

4×2 4×2

③ $-5\begin{bmatrix} 4 & 4 & -1 \end{bmatrix} = \begin{bmatrix} -20 & -20 & 5 \end{bmatrix}$

Simplify expressions.

$$5\left(\begin{bmatrix}3 & 2\\ -3 & -6\end{bmatrix}+\begin{bmatrix}3 & 3\\ 3 & -3\end{bmatrix}\right)=$$

$$5\begin{bmatrix}6 & 5\\ 0 & -9\end{bmatrix}=\begin{bmatrix}30 & 25\\ 0 & -45\end{bmatrix}$$

③ $2\begin{bmatrix} 1 & -3 \end{bmatrix} - \begin{bmatrix} -2 & 1 \end{bmatrix}$

$\begin{bmatrix} 2 & -6 \end{bmatrix} + \begin{bmatrix} +2 & -1 \end{bmatrix}$

$\begin{bmatrix} 4 & -7 \end{bmatrix}$

Solve equations.

① $\begin{bmatrix} 2 & 6 \\ x & 5 \end{bmatrix} + \begin{bmatrix} y & -1 \\ 3 & 0 \end{bmatrix} = \begin{bmatrix} 2 & 5 \\ 8 & 5 \end{bmatrix}$

$2 + y = 2$

$6 + (-1) = 5$

$x + 3 = 8$

$5 + 0 = 5$

$2 + y = 2$
$-2 \quad -2$
$y = 0$

$x + 3 = 8$
$-3 \quad -3$
$x = 5$

(2) $2\begin{bmatrix} 4 & z \\ x & -1 \end{bmatrix} - \begin{bmatrix} y & -8 \\ 3 & -7 \end{bmatrix} = \begin{bmatrix} 2 & 6 \\ 13 & a \end{bmatrix}$

$2(4) - y = 2$

$8 - y = 2$

$6 = y$

$2x - 3 = 13$

$+3 \quad +3$

$\frac{2x}{2} = \frac{16}{2}$

$x = 8$

$2z + 4 = 6$

$-8 \quad -8$

$\frac{2z}{2} = \frac{-2}{2}$

$z = -1$

$2(-1) - (-7) = a$

$-2 + 7$

$5 = a$

$$2Y - \begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 15 & 9 \end{bmatrix}$$

PEMDAS

$$+\begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix} \quad +\begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix}$$

$$\left(\frac{1}{2}\right) 2Y = \left(\frac{1}{2}\right) \begin{bmatrix} 14 & 15 \\ 18 & 2 \end{bmatrix}$$

$$Y = \begin{bmatrix} 7 & \frac{15}{2} \\ 9 & 1 \end{bmatrix}$$

① $5\left(\begin{bmatrix}3 & 2\\ -3 & -6\end{bmatrix}+\begin{bmatrix}3 & 3\\ 3 & -3\end{bmatrix}\right)$

PEMDAS

$5\begin{bmatrix}6 & 5\\ 0 & -9\end{bmatrix}$

$\begin{bmatrix}30 & 25\\ 0 & -45\end{bmatrix}$

(3)

$$2\begin{bmatrix}1 & -3\end{bmatrix} - \begin{bmatrix}-2 & 1\end{bmatrix}$$

$$\begin{bmatrix}2 & -6\end{bmatrix} - \begin{bmatrix}-2 & 1\end{bmatrix}$$

$$= \begin{bmatrix}4 & -7\end{bmatrix}$$

PEMDAS

(7)

$$\begin{bmatrix} 5 & 6 \end{bmatrix} - 5\begin{bmatrix} 2 & 1 \end{bmatrix}$$ scalar

$$\begin{bmatrix} 5 & 6 \end{bmatrix} - \begin{bmatrix} 10 & 5 \end{bmatrix}$$ subtra

$$\begin{bmatrix} -5 & 1 \end{bmatrix}$$

Solve.

① $\begin{bmatrix} 2 & c \\ x & 5 \end{bmatrix} + \begin{bmatrix} y & -1 \\ 3 & 0 \end{bmatrix} = \begin{bmatrix} 2 & 5 \\ 8 & 5 \end{bmatrix}$

TL: $2 + y = 2$

$-2 \quad -2$

$y = 0$

BL: $x + 3 = 8$

$-3 \quad -3$

$x = 5$

② $2\begin{bmatrix} 4 & 2 \\ x & -1 \end{bmatrix} - \begin{bmatrix} y & -8 \\ 3 & -7 \end{bmatrix} = \begin{bmatrix} 2 & b \\ 13 & a \end{bmatrix}$

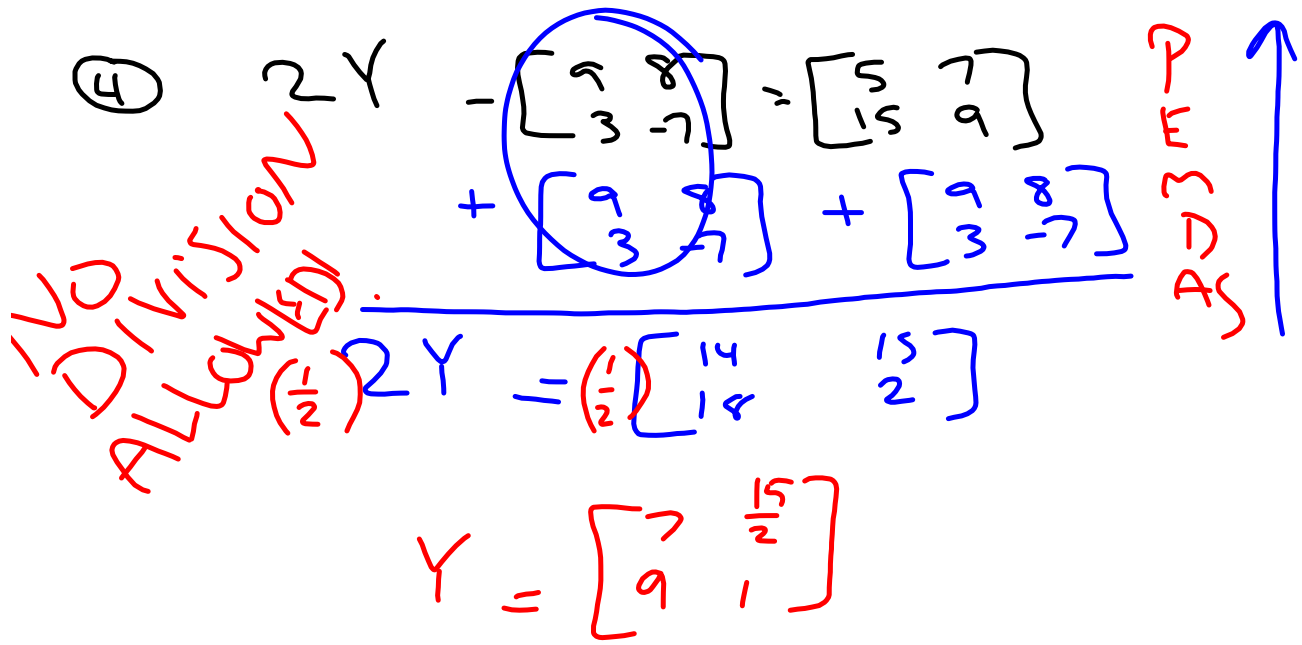
Find y, z, and a.

$2x - 3 = 13$

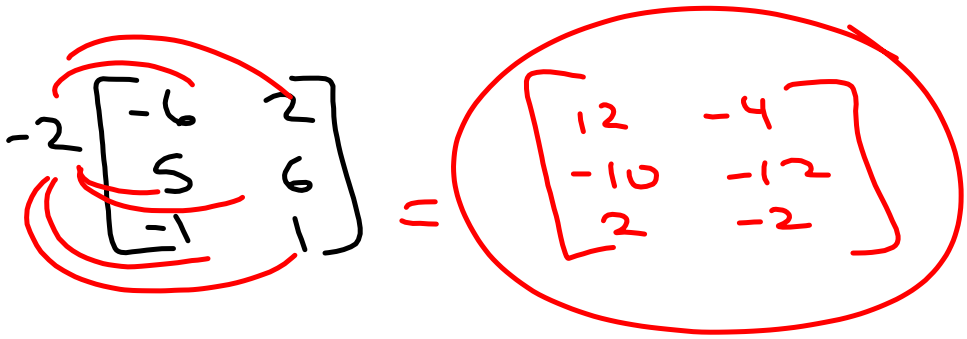
$+3 \quad +3$

$\frac{2x}{2} = \frac{16}{2}$

$x = 8$


④
$2Y - \begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 15 & 9 \end{bmatrix}$
$+ \begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix} + \begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix}$
NO DIVISION ALLOWED!
PEMDAS
$\left(\frac{1}{2}\right) 2Y = \left(\frac{1}{2}\right) \begin{bmatrix} 14 & 15 \\ 18 & 2 \end{bmatrix}$
$Y = \begin{bmatrix} 7 & \frac{15}{2} \\ 9 & 1 \end{bmatrix}$

6



① $5\left(\begin{bmatrix}3 & 2\\ -3 & -6\end{bmatrix}+\begin{bmatrix}3 & 3\\ 3 & -3\end{bmatrix}\right)$

$=\begin{bmatrix}30 & 25\\ 0 & -45\end{bmatrix}$

PEMDAS

③ $2\begin{bmatrix}1 & -3\end{bmatrix}-\begin{bmatrix}-2 & 1\end{bmatrix}$

$\begin{bmatrix}2 & -6\end{bmatrix}-\begin{bmatrix}-2 & 1\end{bmatrix}$

$\begin{bmatrix}4 & -7\end{bmatrix}$

$$2\left([1 \quad 5 \quad -7] + [2 \quad -2 \quad 10]\right)$$

$$2[3 \quad 3 \quad 3]$$

$$[6 \quad 6 \quad 6]$$

P
E
M
D
A
S

(7) $\begin{bmatrix} 5 & 6 \end{bmatrix} - 5\begin{bmatrix} 2 & 1 \end{bmatrix}$

$\begin{bmatrix} 5 & 6 \end{bmatrix} - \begin{bmatrix} 10 & 5 \end{bmatrix}$

$\begin{bmatrix} -5 & 1 \end{bmatrix}$

Solve.

① $\begin{bmatrix} 2 & 6 \\ x & 5 \end{bmatrix} + \begin{bmatrix} y & -1 \\ 3 & 0 \end{bmatrix} = \begin{bmatrix} 2 & 5 \\ 8 & 5 \end{bmatrix}$

$2 + y = 2$
$-2 \quad -2$

$y = 0$

$6 + -1 = 5$

$x = 5$

$x + 3 = 8$

$5 + 0 = 5$

② $2\begin{bmatrix} 4 & z \\ x & -1 \end{bmatrix} - \begin{bmatrix} 5 & -8 \\ 3 & -7 \end{bmatrix} = \begin{bmatrix} 2 & 6 \\ 13 & 9 \end{bmatrix}$

$2x - 3 = 13$

$+3 \quad +3$

$\frac{2x}{2} = \frac{16}{2}$

$x = 8$

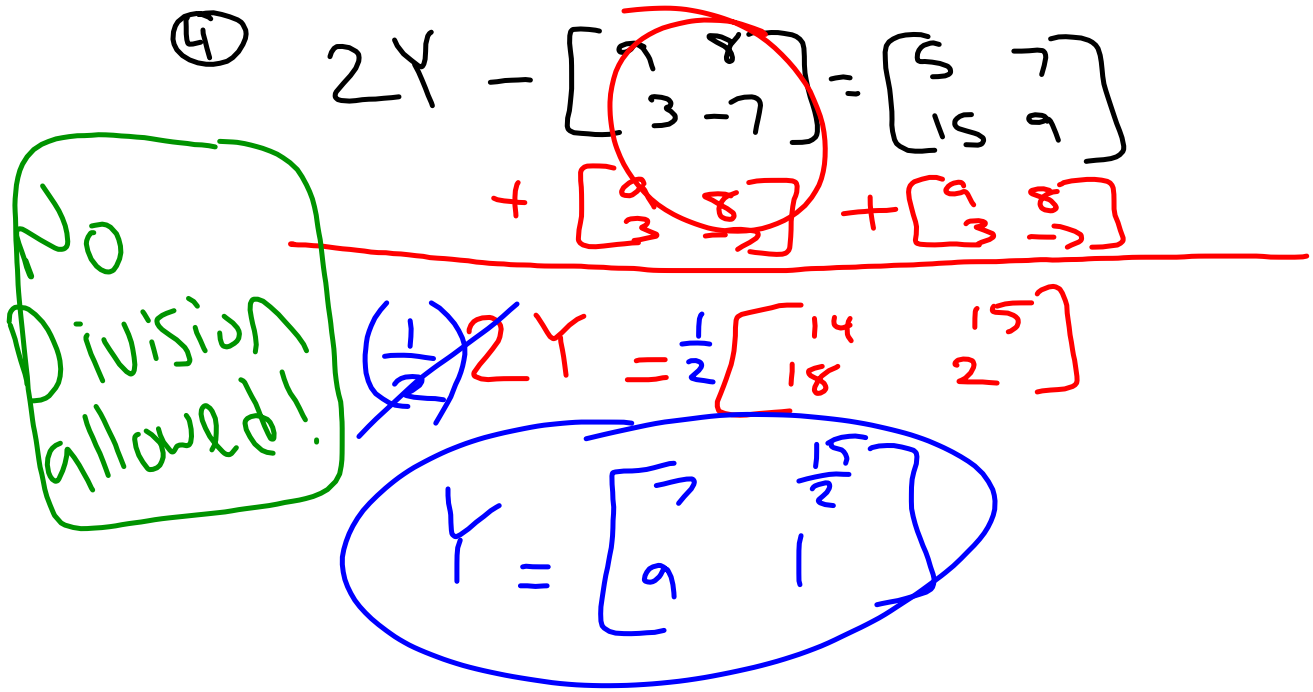
$2z - -8 = 6$

$2z + 8 = 6$

$-8 \quad -8$

$\frac{2z}{2} = \frac{-2}{2}$

$z = -1$


④
$2Y - \begin{bmatrix} 1 & 8 \\ 3 & -7 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 15 & 9 \end{bmatrix}$
$+ \begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix} + \begin{bmatrix} 9 & 8 \\ 3 & -7 \end{bmatrix}$
No Division allowed!
$\frac{1}{2}2Y = \frac{1}{2}\begin{bmatrix} 14 & 15 \\ 18 & 2 \end{bmatrix}$
$Y = \begin{bmatrix} 7 & \frac{15}{2} \\ 9 & 1 \end{bmatrix}$