

#1

$$\begin{bmatrix} 2 & -3 & 4 \\ 0 & 2 & -3 \\ 1 & -1 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 6 \\ 7 \\ 4 \end{bmatrix}$$

#2

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

2×4 4×3 2×3

$$\#3 \quad R_2 - 2R_1 \quad \left[\begin{array}{ccc|ccc} \textcircled{1} & -2 & 1 & 1 & 0 & 0 \\ 2 & -3 & -4 & 0 & 1 & 0 \\ 0 & 0 & -1 & 0 & 0 & 1 \end{array} \right] \xrightarrow{R_1 + 2R_2} \left[\begin{array}{ccc|ccc} 1 & -2 & 1 & 1 & 0 & 0 \\ 0 & \textcircled{1} & -6 & -2 & 1 & 0 \\ 0 & 0 & -1 & 0 & 0 & 1 \end{array} \right]$$

$$\begin{array}{l} R_1 - 4R_2 \\ R_2 - 6R_3 \end{array} \left[\begin{array}{ccc|ccc} 1 & 0 & -11 & -3 & 2 & 0 \\ 0 & 1 & -6 & -2 & 1 & 0 \\ 0 & 0 & \textcircled{-1} & 0 & 0 & 1 \end{array} \right] \xrightarrow{-R_3} \left[\begin{array}{ccc|ccc} 1 & 0 & 0 & -3 & 2 & -11 \\ 0 & 1 & 0 & -2 & 1 & -6 \\ 0 & 0 & -1 & 0 & 0 & 1 \end{array} \right]$$

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 0 & -3 & 2 & -11 \\ 0 & 1 & 0 & -2 & 1 & -6 \\ 0 & 0 & 1 & 0 & 0 & -1 \end{array} \right]$$

inverse is $\begin{bmatrix} -3 & 2 & -11 \\ -2 & 1 & -6 \\ 0 & 0 & -1 \end{bmatrix}$

#4

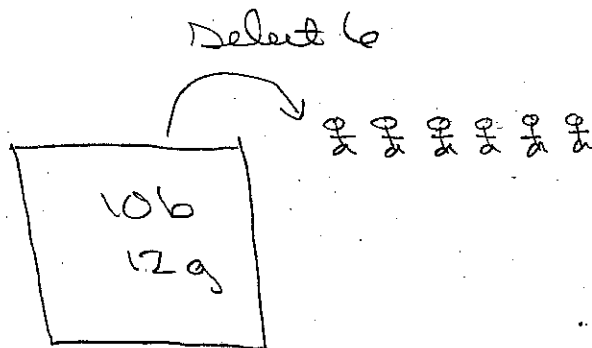
$$\begin{aligned}n(A \cup B) &= n(A) + n(B) - n(A \cap B) \\ &= 28 + 21 - 4 \\ &= 45\end{aligned}$$

#5

I, O, or E

$$\underline{3 * 7 * 7} = 147$$

#6



$$\begin{aligned}P(3b \text{ and } 3g) &= \frac{C(10,3)C(12,3)}{C(22,6)} \\ &= \frac{800}{2261} \approx 0.3538\end{aligned}$$

#7

$$C(8, 4) = 70$$

#8

$$\begin{aligned} P(E \cup F) &= P(E) + P(F) - P(E \cap F) \\ &= 0.03 + 0.01 - 0.001 \\ &= 0.039 \end{aligned}$$

#9

$$P(\text{roll 4} \mid \text{sum is 7}) = 1/6$$

(5, 9)

(1, 6), (2, 5), (3, 4),
(4, 3), (5, 2), (6, 1)

#10a $P(F | B.S.) = \frac{23}{83} \approx 0.2771$

#10b $P(M \cap B.A. \text{ or } B.S.) = \frac{180 + 60}{856}$
 $= \frac{240}{856}$
 ≈ 0.2804

#11 $P(E) = \frac{6}{36} = \frac{1}{6}$

(9,9)

$\boxed{(5,1)}, (5,2), (5,3)$
 $(5,4), (5,5), \boxed{(5,6)}$

$P(F) = \frac{7}{36}$

$(1,5), (2,4), (3,3)$
 $(4,2), \boxed{(5,1)}$

$P(E \cap F) = \frac{1}{36}$

$P(E \cap F) \stackrel{?}{=} P(E)P(F)$

$\frac{1}{36} \stackrel{?}{=} \frac{1}{6} * \frac{7}{36}$

No. NOT independent