2) Find the number nearest to the number 9085345 which must be added to 465 to make the sum exactly divisible by 989.

$$989) \, x + 465$$

→ We basically have to find the nearest multiple of 989 near 9085345.

→ idea

$989 \, \overline{)9085345}$ → $9085345 = 989 \times 9186 + 391$

The nearest multiples of 989 are (to 9085345)

989×9185 , 989×9186 , 989×9187

Such numbers would be of the form $x = 989 \times K - 465$

$$989 \,) \, x + 465$$

→ $K = 9185, 9186, 9187$ (possible values of K) 9085345

check :-

let's find x, when $K = 9185$, $x = 9083500$

x, when $K = 9186$, $x = 9084489$

x, when $K = 9187$, $x = 9085478$

when $K = 9187$, $x = 9085478$, So we get $x + 465 = 9085943$

2.

1, 1, 2, 5, 29, 866, ..

$2 = 1^2 + 1^2$

$5 = 1^2 + 2^2$

$29 = 2^2 + 5^2$

$866 = 29^2 + 5^2$

$X = 29^2 + 866^2 = 750797$

3.   Tuesday → Jan 1st   → 1st date of the year

1st October →   Jan 1st → Tuesday | 7 | 8-1
                       Jan 8th → Tuesday

No of days in January = 31   August = 31

           Feb = 28   Sept = 30

           March = 31

           April = 30

           May = 31

           June = 30

           July = 31

We have to find the number of days between Jan 1st and ↗ 1st day of this

Oct 1st → 274

$\Rightarrow$ 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 1

= 274

So the number of days between Jan 1st and Oct 1st

= 274 - 1 = 273

273 = 7 × 39.

So Oct 1st was Tuesday.

9.

$$
\begin{array}{c|l}
D & CD, \; AE \\
\hline
C & D, \; C \\
\hline
& B, \; A
\end{array}
$$
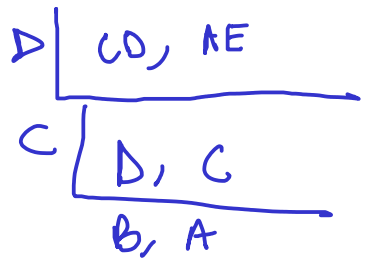
From the above part

$D \times D = CD$, hence $D = 5$ or 6

→ If $D = 5$, then $C = 2$ ⇒ $C \mid D$ if $D = 5, C = 2$

   If $D = 6$, then $C = 3$ but $2 \nmid 5$.

So $D = 6$,   So $C = 3$.

     $D = C \times B$, $6 = 3 \times B$ ⇒ $B = 2$

We have $C = C \times A$ ⇒ $A = 1$

    $D \times C = AE$

$D = 6$ | $6 \times 3 = 18$

$C = 3$ |

          | So $E = 8$.

$A = 1$

Ans :—
$$
\begin{array}{c|l}
6 & 36, \; 18 \\
\hline
3 & 6, \; 3 \\
\hline
& 2, \; 1
\end{array}
$$
     $LCM = 36$