P6 SCMO Round 1 Revision Daily Check-in Questions [Day 3]

1. I have 7 pairs of socks in my drawer, one of each colour of the rainbow. How many socks do I have to draw out in order to guarantee that I have grabbed at least one pair? What if there are likewise coloured pairs of gloves in there and I cannot tell the difference between gloves and socks and I want a matching set?

[Solution]

After grabbing 7 socks, worst case scenario, I have grabbed a sock of each colour. Thus, after grabbing one more sock, it has to match up with one of the previous socks so after grabbing 8 socks I am guaranteed to have a pair. For the second part, after grabbing 21 objects, it is possible that I have grabbed 3 items for each colour and hence have gotten no sets yet. But the 22nd thing I grab must complete one of these 7 sets so after 22 items, I am guaranteed to have a matching set.

2. (RIPMWC2017R1Q18) Pencils of the same shape and size are placed in a big container. There are 9 different colours and 75 pencils in each colour. What is the minimum number of pencils that must be drawn from the container to ensure that the pencils are of at least 5 different colours with at least 10 pencils for each colour?

[Solution]

In the worst-case scenario, we drew 75 pencils from 4 different colours, 9 pencils from the other colours. The minimum number is $4 \times 75 + 5 \times 9 + 1 = 346$

3. (SCMO2012R1Q4) Find the dividend:

[Solution]

First, we have a 4-digit number minus a 3-digit number and the result is a 2-digit number, so $X = 1$, $Y=9$ and $Z=1$.

From $\overline{ABC} \times D = 10\square$, we know $D=1$, $A=1$ and $B=0$.

Next, since $\overline{10C} \times E = 9\square2$, $E=9$, $C=8$ so $Y\square2 = 972$.

From $Y\square2 = 972$, $\overline{PQ}$ must be found between 38 and 47

but as $108 \times F = PQ\square$, $F=4$.

Therefore, the dividend is $108 \times 194 = 20952$

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\begin{array}{r}
\boxed{D}\,\boxed{E}\,\boxed{F} \\
\boxed{A}\,\boxed{B}\,\boxed{C}\,\big)\,2\,\square\,\square\,\square\,\square \\
\boxed{Z}\;0\;\square \\
\boxed{X}\,\square\;1\,\square \\
\boxed{Y}\,\square\;2 \\
\boxed{P}\,\boxed{Q}\,\square \\
\square\,\square\,\square \\
0
\end{array}
$$