# 1 Mon Dis, 2c

Let $a \leq b \leq c \leq d$, we can do this since $\mathbb{N}$ is ordered. We rearrange $a+b+c+d = abcd$ to $a+b+c = d(abc-1)$
Since we have assumed an order, we have $a+b+c \leq 3d$, so $abc - 1 \leq 3$, $abc \leq 4$
Now in this case $abc$ can only be $1, 2, 3, 4$. We consider each of these cases:
$abc = 1 \implies a = 1, b = 1, c = 1$, solving for our original equation gives $3 = 0d$, which does not have a solution.
$abc = 2$, by our assumed order we have $a = 1, b = 1, c = 2$, and we solve $2d = 4 + d$, $d = 4$, this gives a solution.
$abc = 3$, by our assumed order we have $a = 1, b = 1, c = 3$, and we solve $3d = 5 + d$, which does not have an integer solution.
$abc = 4$, by our assumed order we have $a_0 = 1, b_0 = 1, c_0 = 4$, or $a_1 = 1, b_1 = 2, b_2 = 2$. Solving the first equation gives $d = 2$, which contradicts our assumption of $c \leq d$, so this is not a solution. Solving the latter gives $4d = 5 + d$, which does not have an integer solution.
So finally we have our solution: rearrangements of $1, 1, 2, 4$ is the only natural solution to this system.

# 2 Mon Dis, 4g

$$(7, 29) \to (7+1, 29+1) = (8, 30) \to (4, 15)$$
$$(4, 15) \to (4+11, 15+11) = (15, 26)$$
$$(7, 29) \to (7+19, 29+19) = (26, 48)$$
$$((4, 15), (15, 26)) \to (4, 26)$$
$$((4, 26), (26, 48)) \to (4, 48)$$
$$(4, 48) \to (2, 24) \to (1, 12)$$