Q5a) This is false as if n^5-1 is equal to $n^4+n^3+n^2+n+1$, then if n is divisible by $n^4+n^3+n^2+n+1$ then that would mean it would be divisable by itself! As well the proof doesn't take into account $(n-1)$, so n^5-1 would be divisible $(n-1)$ and $n^4+n^3+n^2+n+1$.

b) We will disprove this by counter example, if $x=2$ then

$$2^5-1 = (2-1)(2^4+2^3+2^2+2+1)$$
$$= (2^4+2^3+2^2+2+1)$$
$$= 31 \quad \text{which is prime}$$

$\therefore$ the statement is false for when $n=2$ as that provides a prime

c) k = any integer ≥ 3, $\therefore$ the statement becomes:

$$\forall n \in \mathbb{Z}, \text{ if } n \geq 3, \text{ then } n^5-1 \text{ is composite}$$