3.) a.) There is $\binom{n}{2}$ vertices

vertices

or $\frac{n \cdot (n-1)}{2}$

Edges

b.) $\binom{n}{2}$ = choosing 2 elements from ~~an~~

$\binom{n-2}{2}$ = choosing 2 elements from the remaining $n-2$ ~~and you get the edges~~

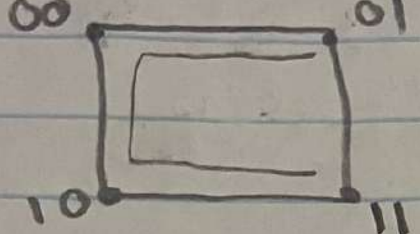
If multiplied you get edges $\binom{n}{2} \cdot \binom{n-2}{2}$

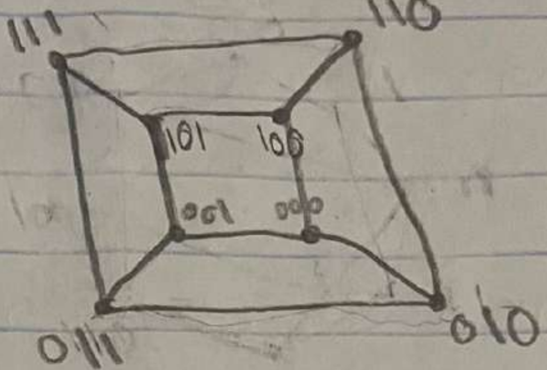
$$\left(\frac{n \cdot (n-1)}{2}\right) \cdot \left(\frac{(n-2) \cdot (n-3)}{2}\right)$$

$$\frac{(n \cdot (n-1) \cdot (n-2) \cdot (n-3))}{4}$$

c.) In G_6 there are enough elements to make connections between any pair of vertices. Assuming $n=6$, you could find 3 connected pairs by using $\binom{6}{2}$ $\binom{4}{2}$ $\binom{2}{2}$ respectively. If you have less than 6 the last vertex couldn't exist and it would not be connected

2.)a.) Q_2 Q_3



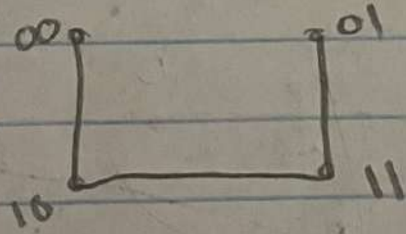


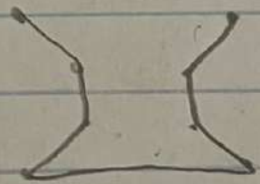
Because it connects to three vertices giving it a three dimensional look

b.) The degree of each vertex is n

c.) The number of edges = $\frac{2^n \cdot n}{2}$

d.) Q_2 Q_3





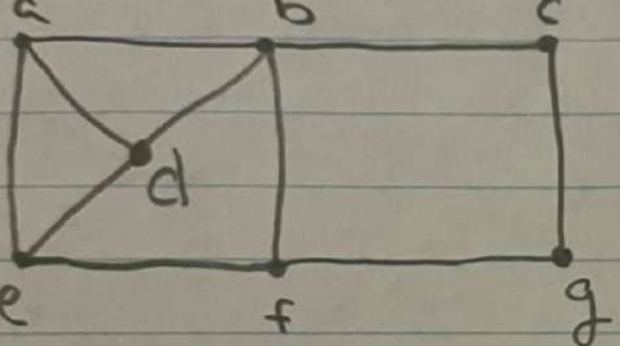
e.) In order for the spanning tree to be drawn in T_{n+1} of Q_{n+1}, you must draw two spanning trees of Q_n and connect them with an edge; while also making it isomorphic.

Homework #8

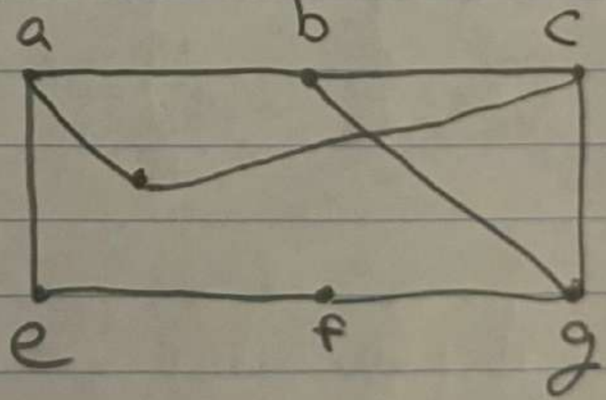
1.)

G: clique {b, c, f, g}
    independent set: {e, b}

H: clique {b, c, g}
    independent set: {a, f, c}



G



H