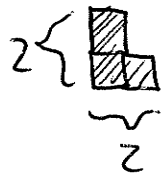
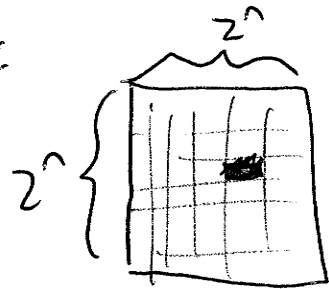




Prove any  $2^n \times 2^n$  grid with one square missing can be filled by ~~one~~ L-shaped


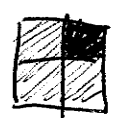


pieces. i.e.:



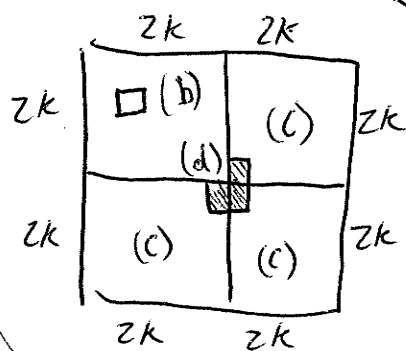
can be filled with  pieces.

①  $P(n)$  a  $2^n \times 2^n$  grid with one square missing can be filled by  pieces

②  $P(1)$ : clearly  can be filled: 

③ Assume  $P(k)$  is true, show for  $P(k+1)$

for a  $2^{k+1} \times 2^{k+1}$  with one square missing: (a) Divide it into 4  $2^k \times 2^k$  squares.



(b) one of those sub-squares will have the missing square.

That region can be filled (By Hypothesis)

(c) the remaining 3 squares can also be filled (By Hypothesis)

after one piece is inserted as in the diagram (d)