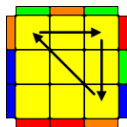


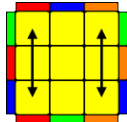
Permutations Last Layer

Corners Only



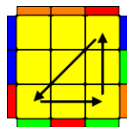
Aa, probability= $\frac{1}{18}$

$I' (U R') D2 (R U' R') D2 R2$
(x') $(R' D R') U2 (R D' R') U2 R2$



E, probability= $\frac{1}{36}$

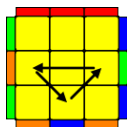
(x') $[(RU'R') \mathbf{D} (\mathbf{RUR'}) \mathbf{D}'] [(\mathbf{RUR'}) \mathbf{D} (RU'R') \mathbf{D}']$



Ab, probability= $\frac{1}{18}$

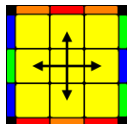
$I (U' R) D2 (R' U R) D2 R2$
(y2) (x') $(L D' L) U2 (L' D L) U2 L2$

Edges Only



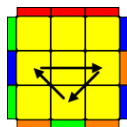
Ua, probability= $\frac{1}{18}$

$\mathbf{M2} \mathbf{U}' (M U2 M') \mathbf{U}' \mathbf{M2}$
 $F2 \mathbf{U} (M' U2 M) \mathbf{U} F2$



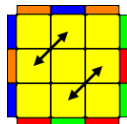
H, probability= $\frac{1}{72}$

$(\mathbf{M2} U \mathbf{M2}) \mathbf{U2} (\mathbf{M2} U \mathbf{M2})$



Ub, probability= $\frac{1}{18}$

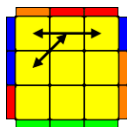
$\mathbf{M2} \mathbf{U} (M U2 M') \mathbf{U} \mathbf{M2}$
 $F2 \mathbf{U}' (M' U2 M) \mathbf{U}' F2$



Z, probability= $\frac{1}{36}$

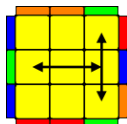
$\mathbf{M2} U \mathbf{M2} U (\mathbf{M}' \mathbf{U2}) (\mathbf{M2} U2) M' U2$
(y') $M' U (\mathbf{M2} U \mathbf{M2} U) M' U2 \mathbf{M2} U'$

Adjacent Corner Swap



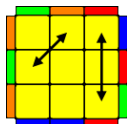
Ja, probability= $\frac{1}{18}$

$(R' U L') \mathbf{U2} (R U' R') \mathbf{U2} (L R) U'$
(y) (x) $R2 F R F' R U2 r' U r U2$



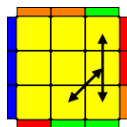
T, probability= $\frac{1}{18}$

$R U R' U' R' F R2 U' R' U' R U R' F'$
 $R2 U R2 U' R2 U' D R2 U' R2 U R2 D'$



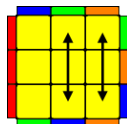
Ra, probability= $\frac{1}{18}$

$(R U' R' U') (R U R D) (R' U' R D') R' U2 R'$



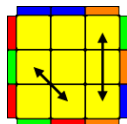
Jb, probability= $\frac{1}{18}$

$(R U R' F') [R U R' U' R' F R2 U' R' U']$



F, probability= $\frac{1}{18}$

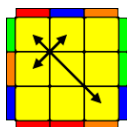
$(R' U F') [R U R' U' R' F R2 U' R' U' R U R' U] R$



Rb, probability= $\frac{1}{18}$

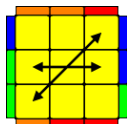
$R2 \mathbf{F} R (U R U' R') \mathbf{F}' R U2 R' U2 R U$
(y') $R' U2 R U2 R' F (R U R' U') R' F' R2' U'$

Diagonal Corner Swap



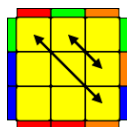
Y, probability= $\frac{1}{18}$

$\mathbf{F} [(R U' R' U') (R U R' F') (\mathbf{R} U \mathbf{R}' U') R' F R] \mathbf{F}'$



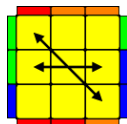
Na, probability= $\frac{1}{72}$

$[r' D r U2] \times 5$
 $(L D L' F') \text{TPerm without F} (L D' L')$



V, probability= $\frac{1}{18}$

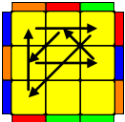
$(R' U R' U') (\mathbf{y}) R' F' R2 U' R' U R' F R F$



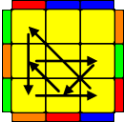
Nb, probability= $\frac{1}{72}$

$R' (\mathbf{U} R \mathbf{U}' R') (F' U' F) (R U R' F) R' F' R U' R$

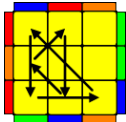
G Permutations



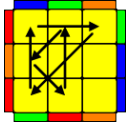
Ga, probability= $\frac{1}{18}$
D' R2 (U R' U R') **U'** R U' R2 (U' D) **R'** U R
(**y'**) (RU R'U' R') UF (RU R U' R') F' U R' U2 R



Gc, probability= $\frac{1}{18}$
D R2 U' R U' (R **U** R' **U**) R2 (U D') **R** U' R'
(**y**) F2' D' L U' L U L' D F2 R U' R'



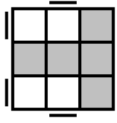
Gb, probability= $\frac{1}{18}$
D R' U' R (U D') **R2** U (R' U R U') R U' R2
R' U' R (**y**) R2 u (R' U R U' R) u' R2



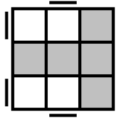
Gd, probability= $\frac{1}{18}$
D' R U R' (U' D) **R2** U' R U' (R' U R' U) R2
L U2 L' U F' (L' U' L U L) F U (L' U' L' U L)

Orientation Last Layer

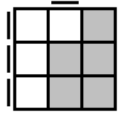
OLL 1



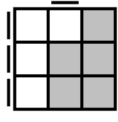
T1, probability= $\frac{1}{54}$
F (**R U R' U'**) F



T2, probability= $\frac{1}{54}$
(**R U R' U'**) (**R' F R F'**)

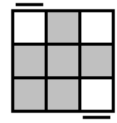


P1, probability= $\frac{1}{54}$
f (**R U R' U'**) f

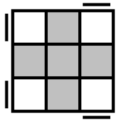


F4, probability= $\frac{1}{54}$
F [R U' R' U'] (R U R') F'

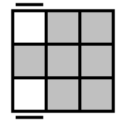
OLL 2



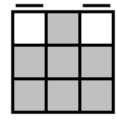
Sune, probability= $\frac{4}{27}$
(**R U R' U**) **R** U2 R'



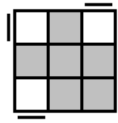
Pi, probability= $\frac{4}{27}$
f (**R U R' U'**) (**f' F**) (**R U R' U'**)



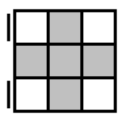
T, probability= $\frac{4}{27}$
(**r U R' U'**)(**r' F R F'**)
(**y'**) (**x'**) (**R U R'**) **D** (R U' R') **D'**



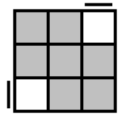
Headlights, probability= $\frac{4}{27}$
R2 [**D** (R' U2) R] [**D'** (R' U2) R']



antisune, probability= $\frac{4}{27}$
(L' U' L U') **L'** U2 L
(**y'**) (**R U2 R' U'**) R U' R'



Cross, probability= $\frac{2}{27}$
f (**R U R' U'**)x3 f



L, probability= $\frac{4}{27}$
F' (**r U R' U'**) (r' F R)
(**y'**) (**x'**) (R U' R') **D** (**R U R'**) **D'**