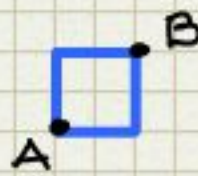
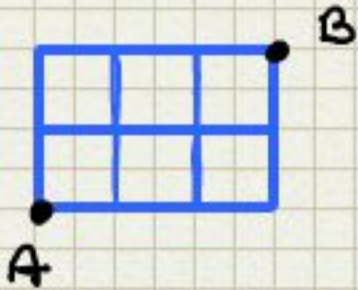
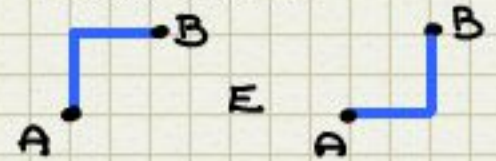


Caminhos possíveis



2 POSSÍVEIS CAMINHOS

MOVIMENTOS PARA DIREITA
PARA CIMA



PARA CALCULAR OS POSSÍVEIS CAMINHOS
PODEMOS PENSAR EM ANAGRAMAS

PARA CHEGAR DE A ATÉ B
PRECISAMOS IR 3 VEZES PARA
DIREITAS E 2 VEZES PARA CIMA

DDDC

POR EXEMPLO

DDDC

REPRESENTA O SEGUINTE CAMINHO



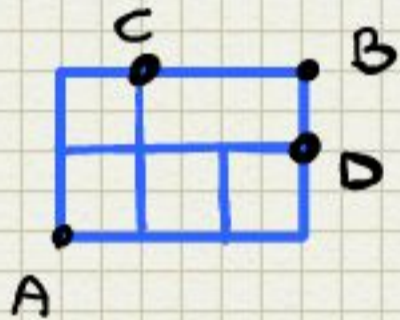
CCDD



RESPOSTA: $\frac{5!}{3!2!} = \binom{5}{3}$

MOVIMENTO PARA DIREITA COMO COVERSÃO

AGORA COMPLICAMOS UM POUCO ELIMINANDO POSSÍVEIS CAMINHOS



PODEMOS DIVIDIR O PROBLEMA EM 2 CASOS

ACB MAIS ADB

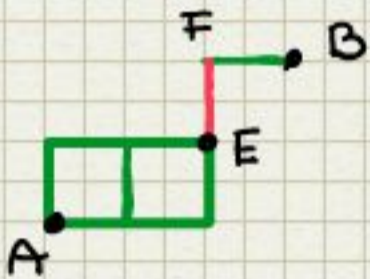
AC $\binom{3}{1}$
AD $\binom{4}{3}$

CB $\binom{2}{2}$
DB $\binom{1}{0}$

$\binom{3}{1} \cdot \binom{2}{2} = 3$
 $\binom{4}{3} \cdot \binom{1}{0} = 4$

TEREMOS 7 POSSÍVEIS CAMINHOS

MODO ALTERNATIVO

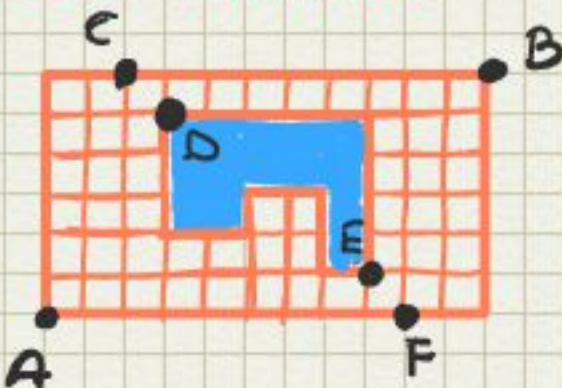


PODEMOS EXCLUIR DO TOTAL

AE $\binom{3}{2}$ EF $\binom{1}{0}$ FB $\binom{1}{1}$

TOT 3
RESPOSTA: $10 - 3 = 7$

NOVO EXEMPLO



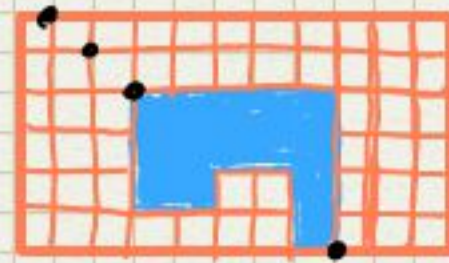
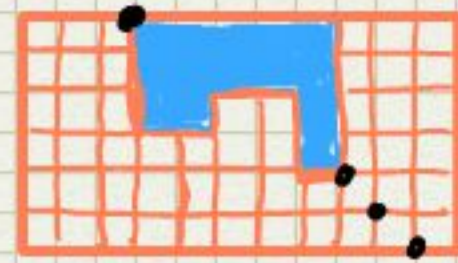
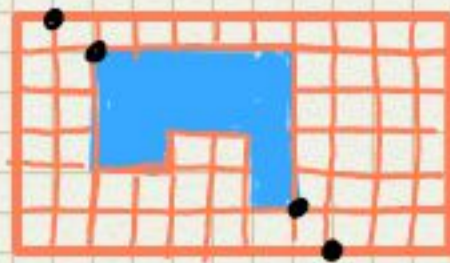
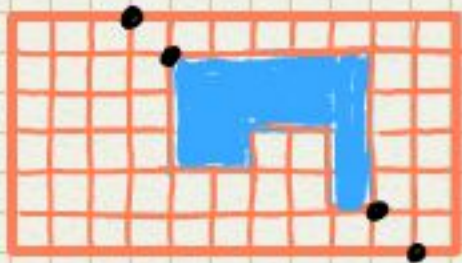
TOT $\binom{17}{11} = \frac{17 \cdot 16 \cdot 15 \cdot 14 \cdot 13 \cdot 12}{6 \cdot 5 \cdot 4 \cdot 3 \cdot 2} = 17 \cdot 14 \cdot 13 \cdot 4$

ACB $\binom{8}{2} \binom{9}{9} = 28$
ADB $\binom{8}{2} \binom{9}{9} = 504$
AEB $\binom{8}{2} \binom{9}{9} = 504$
AFB $\binom{9}{5} \binom{2}{2} = 28$

TOT 1064

$\frac{1064}{17 \cdot 14 \cdot 13 \cdot 4} \approx 8.6\%$

AGORA EXAMINAREMOS O QUE ACONTECE SE MUDAMOS A ZONA PROIBIDA PARA ESQUERDA, PARA DIREITA, PARA CIMA, PARA BAIXO



$$\binom{9}{3} \binom{8}{8}$$

$$\binom{9}{4} \binom{8}{7}$$

$$\binom{10}{9} \binom{7}{2}$$

$$\binom{10}{10} \binom{7}{1}$$

$$\binom{7}{1} \binom{10}{10}$$

$$\binom{7}{2} \binom{10}{9}$$

$$\binom{8}{7} \binom{9}{1}$$

$$\binom{8}{8} \binom{9}{3}$$

$$\binom{9}{3} \binom{8}{8}$$

$$\binom{10}{8} \binom{7}{3}$$

$$\binom{10}{9} \binom{7}{2}$$

$$\binom{10}{10} \binom{7}{1}$$

$$\binom{7}{1} \binom{10}{10}$$

$$\binom{7}{2} \binom{10}{9}$$

$$\binom{7}{3} \binom{10}{8}$$

$$\binom{8}{8} \binom{9}{3}$$

$$84 + 1008 + 210 + 7$$

$$84 + 1575 + 210 + 7$$

1309

DIREITA
ESQUERDA

1876

PARA CIMA
PARA BAIXO

10.6%

15.2%



$$\binom{6}{1} \binom{5}{5} = 6$$

$$\binom{6}{2} \binom{5}{4} = 75$$

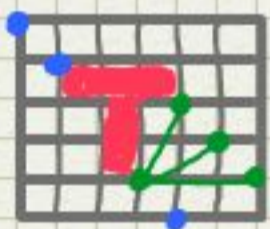
$$\binom{5}{4} \binom{3}{1} \binom{3}{1} = 45$$

$$\binom{5}{4} \binom{3}{2} \binom{3}{0} = 15$$

$$\binom{5}{5} \binom{6}{1} = 6$$

147
CAMINHOS

8.57%



$$\binom{5}{0} \binom{6}{6} = 1$$

$$\binom{5}{1} \binom{6}{5} = 30$$

$$\binom{4}{3} \binom{3}{2} \binom{4}{1} = 42$$

$$\binom{4}{3} \binom{3}{2} \binom{4}{1} = 48$$

$$\binom{4}{3} \binom{3}{0} \binom{4}{0} = 4$$

$$\binom{4}{4} \binom{7}{2} = 21$$

176
CAMINHOS

10.26%



$$\binom{3}{0} \binom{3}{1} \binom{5}{5} = 3$$

$$\binom{3}{0} \binom{3}{2} \binom{5}{4} = 15$$

$$\binom{3}{1} \binom{3}{0} \binom{5}{5} = 3$$

$$\binom{3}{1} \binom{3}{1} \binom{5}{4} = 45$$

$$\binom{5}{4} \binom{6}{2} = 75$$

$$\binom{5}{5} \binom{6}{1} = 6$$

147
CAMINHOS

(RESULTADO ESPERADO
POR CAUSA DA SIMETRIA
ROZACIONAL)

CAMINHOS TOTAIS $13! / 6! 7! = 13 \cdot 12 \cdot 11 = 1716$