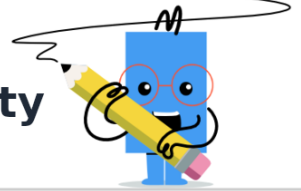
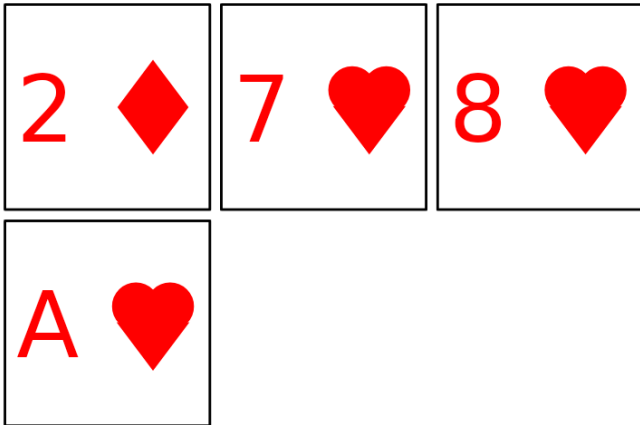


**Probability and Statistics - Probability with Factorials Intro**

1 How many distinct ways can these cards be ordered? Show as a multiplication.



A

$$3 \cdot 2$$

B

$$\frac{4 \cdot 3 \cdot 2}{1 \cdot 2}$$

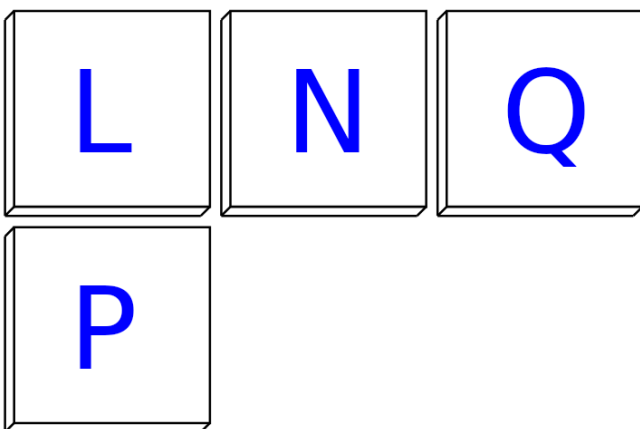
C

$$4 \cdot 3 \cdot 2$$

D

$$\frac{4 \cdot 3 \cdot 2}{4 \cdot 3 \cdot 2 \cdot 1}$$

2 How many distinct ways can these letter tiles be ordered? Show as a multiplication.



A

$$\frac{4 \cdot 3 \cdot 2}{1 \cdot 2}$$

B

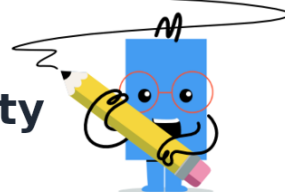
$$\frac{4 \cdot 3 \cdot 2}{3 \cdot 2}$$

C

$$4 \cdot 3 \cdot 2$$

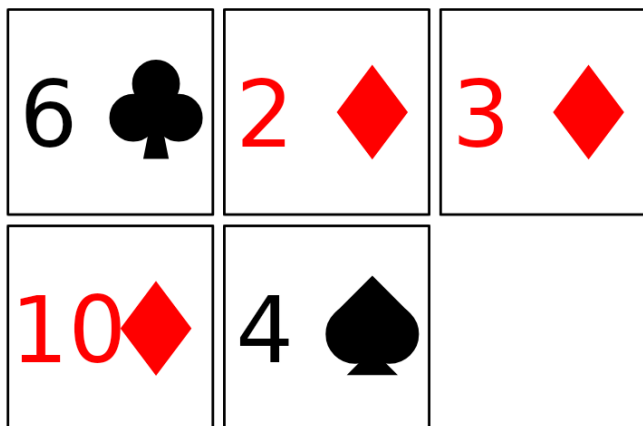
D

$$\frac{4 \cdot 3 \cdot 2}{4 \cdot 3 \cdot 2 \cdot 1}$$



Probability and Statistics - Probability with Factorials Intro

3 How many distinct ways can these cards be ordered? Show as a multiplication.



A

$$4 \cdot 3 \cdot 2$$

B

$$5 \cdot 4 \cdot 3 \cdot 2$$

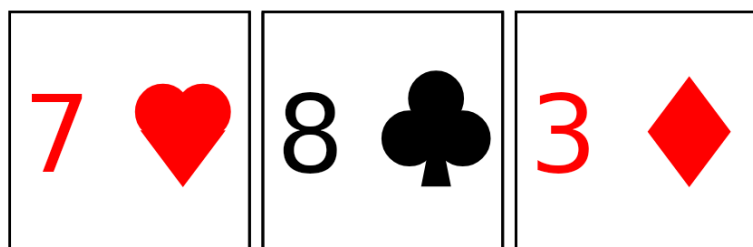
C

$$\frac{5 \cdot 4 \cdot 3 \cdot 2}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$$

D

$$\frac{5 \cdot 4 \cdot 3 \cdot 2}{2}$$

4 How many distinct ways can these cards be ordered? Show as a factorial.



A

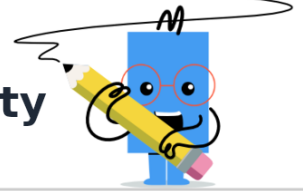
$$\frac{3!}{1! \cdot 2!}$$

B

$$3!$$

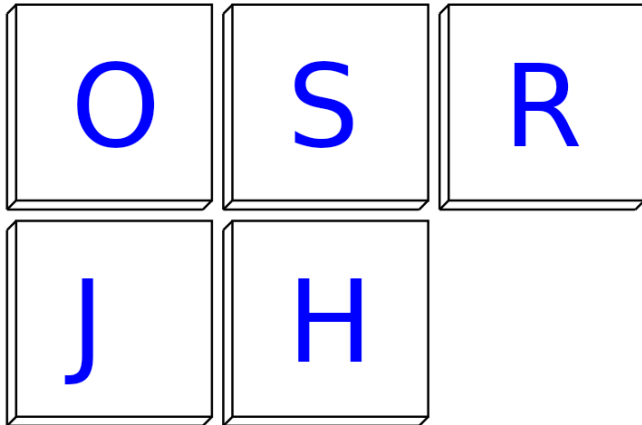
C

$$\frac{3!}{3! \cdot 0!}$$



Probability and Statistics - Probability with Factorials Intro

5 How many distinct ways can these letter tiles be ordered? Show as a multiplication.



A

$$\frac{5 \cdot 4 \cdot 3 \cdot 2}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$$

B

$$\frac{5 \cdot 4 \cdot 3 \cdot 2}{2}$$

C

$$5 \cdot 4 \cdot 3 \cdot 2$$

D

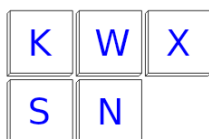
$$\frac{6 \cdot 5 \cdot 4 \cdot 3 \cdot 2}{2}$$

6 How many distinct ways can these cards be ordered?



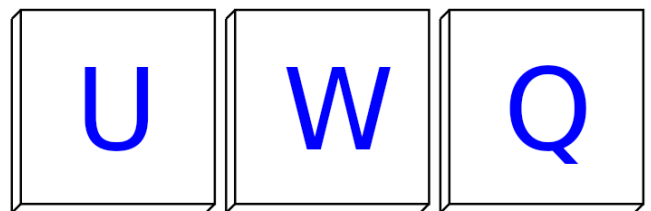
A	120	B	14	C	12
D	4	E	1	F	3

8 How many distinct ways can these letter tiles be ordered?



A	1	B	120	C	8
D	10	E	11	F	17

7 How many distinct ways can these letter tiles be ordered? Show as a factorial.



A

$$3!$$

B

$$\frac{3!}{3!}$$

C

$$5!$$

D

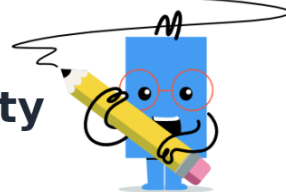
$$\frac{3!}{1! \cdot 2!}$$

E

$$\frac{3!}{3! \cdot 0!}$$

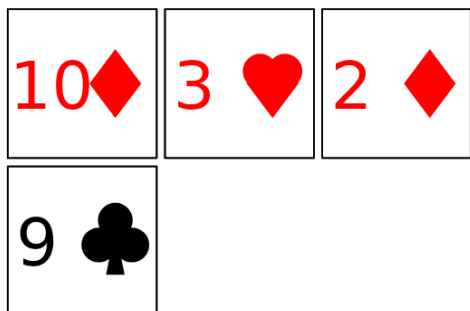
F

$$\frac{5!}{3!}$$



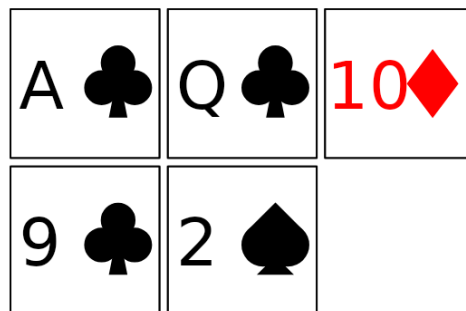
Probability and Statistics - Probability with Factorials Intro

- 9** How many distinct ways can these cards be ordered? Show as a factorial.



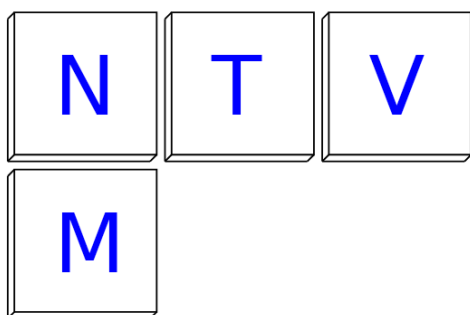
A	$\frac{4!}{1! \cdot 3!}$	B	$\frac{6!}{2!}$
C	$\frac{4!}{1! \cdot 2!}$	D	$4!$
E	$\frac{6!}{4!}$	F	$\frac{4!}{4! \cdot 0!}$

- 10** How many distinct ways can these cards be ordered? Show as a factorial.



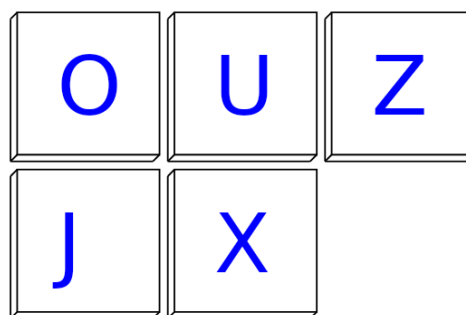
A	$\frac{6!}{2!}$	B	$\frac{5!}{1! \cdot 2!}$
C	$\frac{5!}{5! \cdot 0!}$	D	$\frac{5!}{3!}$
E	$3!$	F	$5!$

- 11** How many distinct ways can these letter tiles be ordered? Show as a factorial.

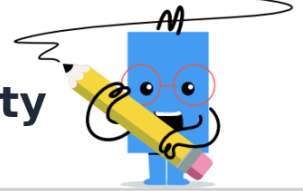


A	$\frac{4!}{1! \cdot 2!}$	B	$\frac{4!}{1! \cdot 3!}$
C	$4!$	D	$\frac{4!}{3!}$
E	$3!$	F	$\frac{4!}{4! \cdot 0!}$

- 12** How many distinct ways can these letter tiles be ordered? Show as a factorial.

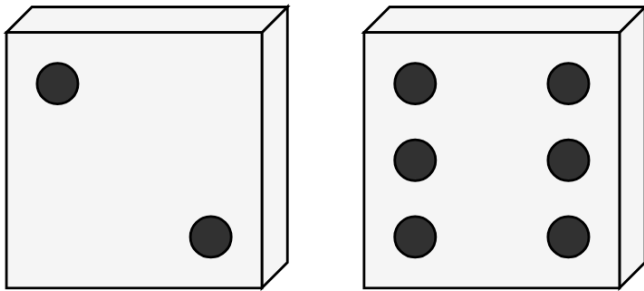


A	$\frac{5!}{1! \cdot 2!}$	B	$\frac{5!}{1! \cdot 3!}$
C	$\frac{5!}{5! \cdot 0!}$	D	$5!$
E	$\frac{5!}{3!}$	F	$7!$



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13 What is the equation for the chance of rolling at least one 5 on these dice?



A

$$\frac{1}{6}$$

B

$$\frac{1}{6} + \frac{1}{6} - \frac{1}{6} \cdot \frac{1}{6}$$

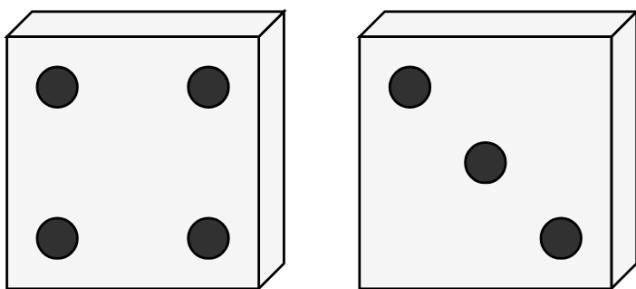
C

$$1 - \frac{1}{6} \cdot \frac{1}{6}$$

D

$$\frac{1}{6} \cdot \frac{1}{6}$$

14 What is the chance of rolling at least one 1 on these dice?



A $\frac{4}{32}$

B $\frac{6}{28}$

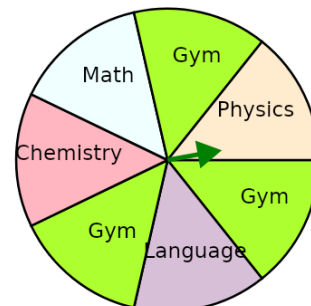
C $\frac{18}{65}$

D $\frac{11}{36}$

E $\frac{4}{47}$

F $\frac{18}{15}$

15 Calculate the probability of spinning Gym at least once, given two spins. Show as an equation



P(Gym in 2 spins)

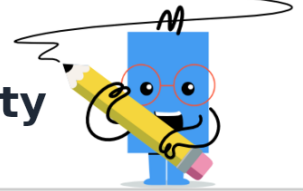
A $\frac{13}{5} + \frac{5}{7} \cdot \frac{19}{7}$

B $\frac{18}{7} + \frac{7}{9} \cdot \frac{13}{5}$

C $\frac{10}{7} - \frac{1}{8} \cdot \frac{19}{6}$

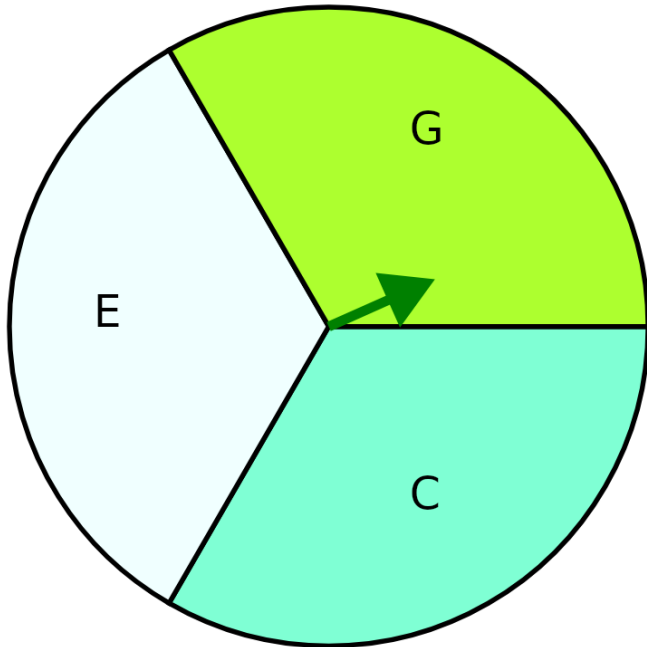
D $\frac{3}{7} + \frac{3}{7} + \frac{3}{7} \cdot \frac{3}{7}$

E $\frac{3}{7} + \frac{3}{7} - \frac{3}{7} \cdot \frac{3}{7}$



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16 Calculate the probability of spinning G at least once, given two spins. Show as an equation



P(G in 2 spins)

A

$$\frac{1}{3} + \frac{1}{3} - \frac{1}{3} \cdot \frac{1}{3}$$

B

$$\frac{6}{1} - \frac{1}{4} \cdot \frac{5}{1}$$

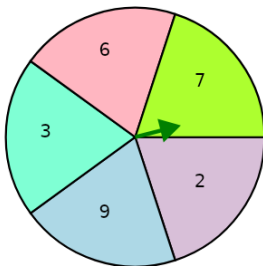
C

$$\frac{7}{5} + \frac{1}{1} \cdot \frac{1}{3}$$

D

$$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} \cdot \frac{1}{3}$$

17 Calculate the probability of spinning 7 at least once, given two spins. Show as a fraction



P(7 in 2 spins)

A $\frac{11}{24}$

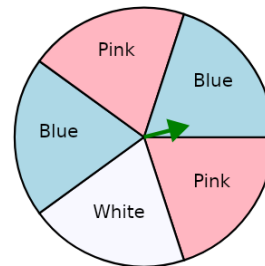
B $\frac{9}{25}$

C $\frac{9}{27}$

D $\frac{9}{23}$

E $\frac{8}{24}$

18 Calculate the probability of spinning Pink at least once, given two spins. Show as a fraction



P(Pink in 2 spins)

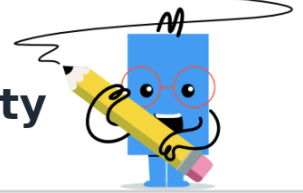
A $\frac{11}{25}$

B $\frac{11}{26}$

C $\frac{20}{24}$

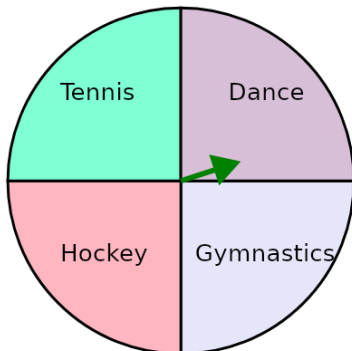
D $\frac{11}{23}$

E $\frac{16}{25}$



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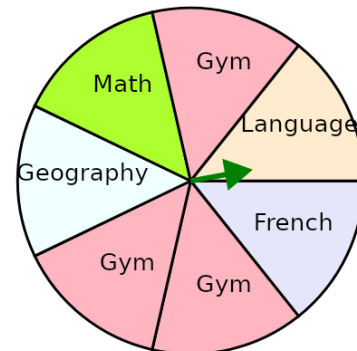
19 Calculate the probability of spinning Dance at least once, given two spins. Show as a decimal



P(Dance in 2 spins)

A	0.52	B	0.47	C	0.38
D	0.13	E	0.5	F	0.44

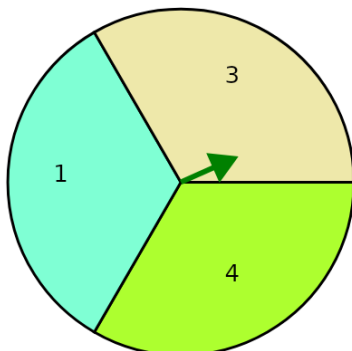
20 Calculate the probability of spinning Language at least once, given two spins. Show as a decimal



P(Language in 2 spins)

A	0.29	B	0.16	C	0.28
D	0.22	E	0.27	F	0.3

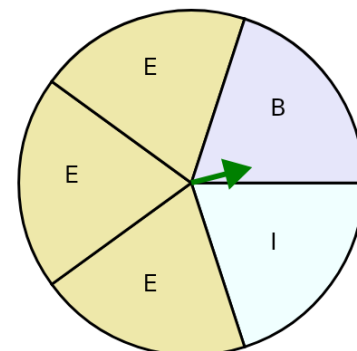
21 Calculate the probability of spinning 3 at least once, given two spins. Show as a percent



P(3 in 2 spins)

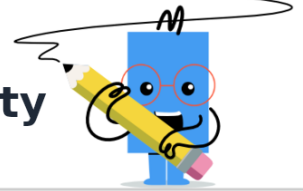
A	0%	B	56%	C	125%
D	57%	E	42%	F	22%

22 Calculate the probability of spinning E at least once, given two spins. Show as a percent



P(E in 2 spins)

A	72%	B	78%	C	68%
D	80%	E	84%	F	100%



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- 23** Select the correct equivalent to this factorial
 $3!$

A $5 \cdot 4$	B $3 \cdot 2$
C 2	D 4

- 24** Select the correct equivalent to this factorial
 $4!$

A 24	B 120
C 12	D $\frac{1}{4}$
E 2	

- 25** Select the correct factorial equivalent to this multiplication

$$5 \cdot 4 \cdot 3 \cdot 2$$

A $6!$	B $7!$
C $5!$	D $4!$

- 26** Select the correct equivalent to this factorial

$$\frac{5!}{3!}$$

A $5 \cdot 4$	B 6
C 1	D 4
E $6 \cdot 5 \cdot 4 \cdot 3$	

- 27** Select the correct equivalent to this factorial
 $\frac{5!}{2!}$

A $\frac{1}{20}$	B $\frac{1}{6}$
C $\frac{1}{5040}$	D 120
E 60	

- 28** Select the correct factorial equivalent to this multiplication

$$5 \cdot 4$$

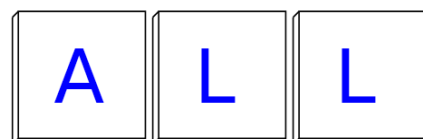
A $\frac{5!}{3!}$	B $\frac{4!}{2!}$	C $\frac{4!}{5!}$
D $\frac{3!}{5!}$	E $\frac{3!}{2!}$	

- 29** How many ways can these cards be arranged to still be arranged smallest to largest?

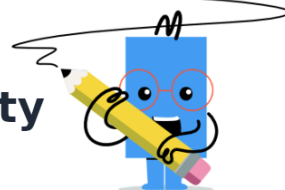


A 4	B 24	C 6
D 12	E 2	

- 30** How many ways can these letter tiles be ordered to spell 'ALL'?

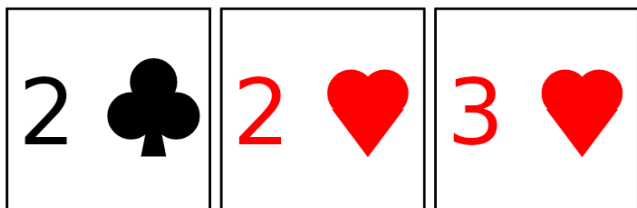


A 6	B 24	C 2
D 4	E 12	



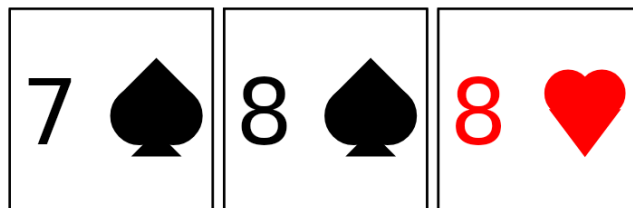
Probability and Statistics - Probability with Factorials Intro

31 How many ways can these cards be arranged to still be arranged smallest to largest? Show as a multiplication.



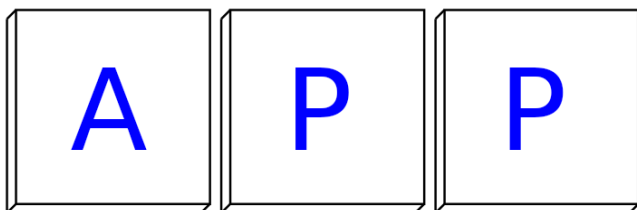
A	$4 \cdot 3 \cdot 2$	B	$\frac{2}{2 \cdot 1}$
C	$\frac{1}{2 \cdot 1}$	D	2
E	$2 \cdot 2$	F	$3 \cdot 2$

32 How many ways can these cards be arranged to still be arranged smallest to largest? Show as a factorial.



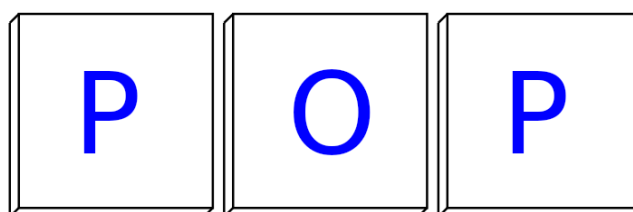
A	$2!$	B	$3!$
C	$2! \cdot 3!$	D	$4!$
E	$\frac{2!}{2! \cdot 1!}$	F	$2! \cdot 2!$

33 How many ways can these letter tiles be ordered to spell 'APP'? Show as a multiplication.

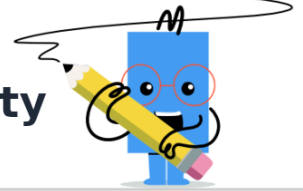


A	$\frac{2}{2 \cdot 1}$	B	$2 \cdot 2$
C	$4 \cdot 3 \cdot 2$	D	2
E	$3 \cdot 2$	F	$\frac{1}{2 \cdot 1}$

34 How many ways can these letter tiles be ordered to spell 'POP'? Show as a factorial.

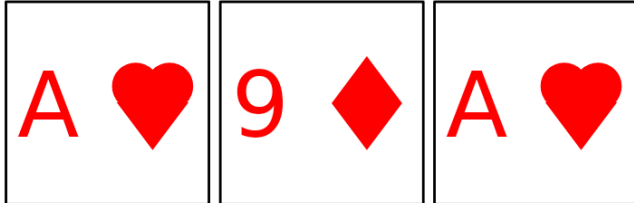


A	$\frac{2!}{2! \cdot 1!}$	B	$2! \cdot 2!$
C	$4!$	D	$2! \cdot 3!$
E	$3!$	F	$2!$



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35 How many distinct ways can these cards be ordered? Show as a multiplication.



A
$$\frac{3 \cdot 2}{3 \cdot 2 \cdot 1}$$

B
$$\frac{3 \cdot 2}{2 \cdot 3 \cdot 2}$$

C
$$\frac{3 \cdot 2}{3 \cdot 2}$$

D
$$\frac{4 \cdot 3 \cdot 2}{2}$$

E
$$\frac{3 \cdot 2}{2}$$

36 What is the value of this factorial expression?
 $2!$

A	2	B	1
C	$\frac{1}{6}$		

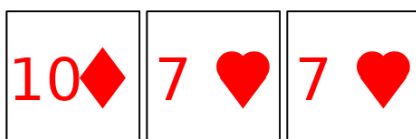
37 What is the value of this factorial expression?
 $4! \cdot 3!$

A	72	B	24
C	144	D	1
E	3		

38 What is the value of this factorial expression?
 $\frac{2!}{4!}$

A	1	B	$\frac{1}{12}$
C	$\frac{1}{24}$	D	5

40 How many distinct ways can these cards be ordered?

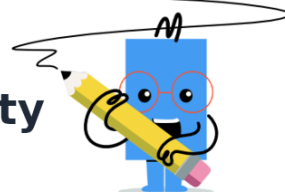


A	12	B	3	C	19
D	13	E	4	F	1

39 How many distinct ways can these cards be ordered? Show as a factorial.

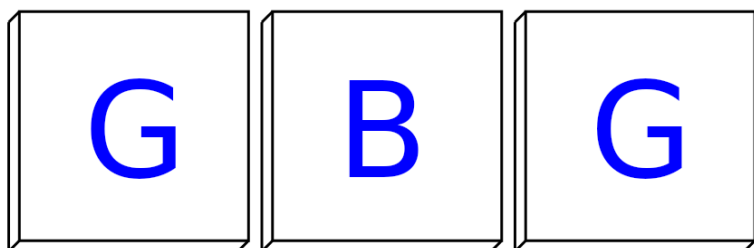


A	$\frac{3!}{2! \cdot 3!}$	B	$\frac{3!}{2!}$
C	$\frac{4!}{2!}$	D	$\frac{3!}{3! \cdot 0!}$
E	$\frac{5!}{2!}$	F	$\frac{5!}{2! \cdot 2!}$



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41 How many distinct ways can these letter tiles be ordered? Show as a multiplication.



A

$$\frac{3 \cdot 2}{3 \cdot 2 \cdot 1}$$

B

$$\frac{3 \cdot 2}{2 \cdot 2}$$

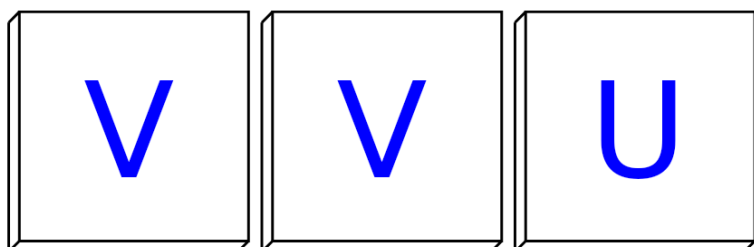
C

$$\frac{3 \cdot 2}{3 \cdot 2}$$

D

$$\frac{3 \cdot 2}{2}$$

42 How many distinct ways can these letter tiles be ordered? Show as a factorial.



A

$$\frac{4!}{2!}$$

B

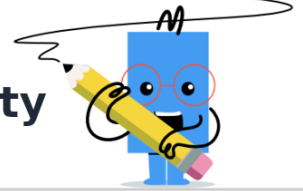
$$\frac{3!}{3! \cdot 0!}$$

C

$$\frac{3!}{3!}$$

D

$$\frac{3!}{2!}$$



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43 How many distinct ways can these letter tiles be ordered?



A	9	B	3	C	0
D	14	E	1	F	12

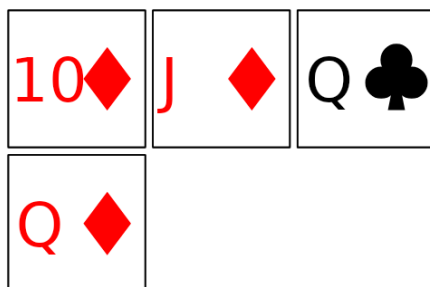
44 What is the value of this factorial expression?
 $(6 - 6)!$

A	1	B	$\frac{1}{12}$
C	$\frac{1}{24}$	D	$\frac{1}{6}$

45 What is the value of this factorial expression?
 $5! \cdot (3 - 2)!$

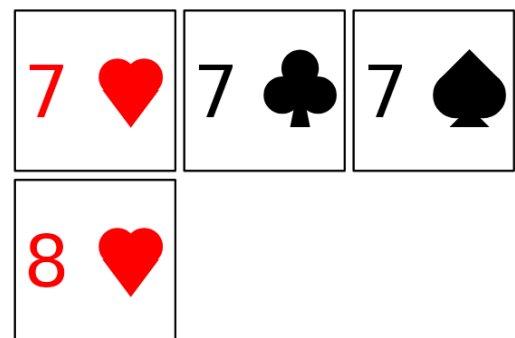
A	24	B	1
C	240	D	120

47 How many ways can these cards be arranged to still be arranged smallest to largest? Show as a factorial.



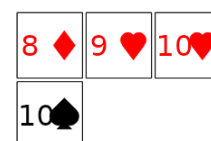
A	$2! \cdot 2!$	B	$4!$
C	$2!$	D	$\frac{2!}{2! \cdot 1!}$
E	$2! \cdot 3!$	F	$3!$

46 How many ways can these cards be arranged to still be arranged smallest to largest? Show as a multiplication.

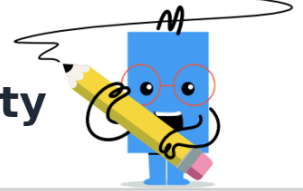


A	$3 \cdot 2 \cdot 3 \cdot 2$	B	$4 \cdot 3 \cdot 2$
C	$3 \cdot 2 \cdot 2$	D	$\frac{2}{3 \cdot 2 \cdot 1}$
E	$3 \cdot 2$	F	$\frac{1}{3 \cdot 2 \cdot 1}$

48 How many ways can these cards be arranged to still be arranged smallest to largest?

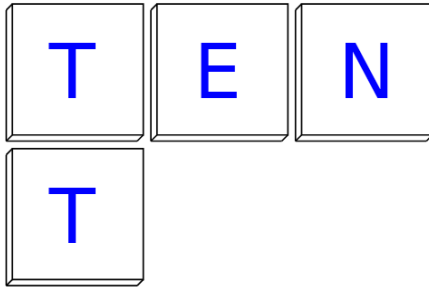


A	12	B	24	C	6
D	2	E	4		



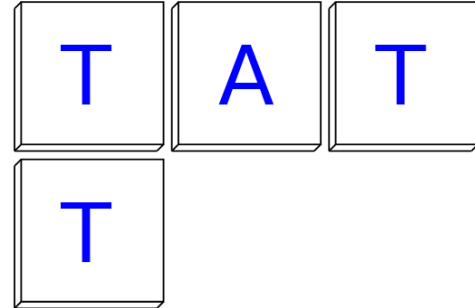
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- 49** How many ways can these letter tiles be ordered to spell 'TENT'? Show as a multiplication.



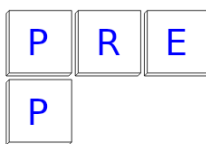
A	$4 \cdot 3 \cdot 2$	B	$3 \cdot 2$
C	$2 \cdot 2$	D	2
E	$\frac{2}{2 \cdot 1}$	F	$\frac{1}{2 \cdot 1}$

- 50** How many ways can these letter tiles be ordered to spell 'TATT'? Show as a factorial.



A	$4!$	B	$3!$
C	$\frac{1}{3! \cdot 1!}$	D	$3! \cdot 3!$
E	$\frac{2!}{3! \cdot 1!}$	F	$5!$

- 51** How many ways can these letter tiles be ordered to spell 'PREP'?



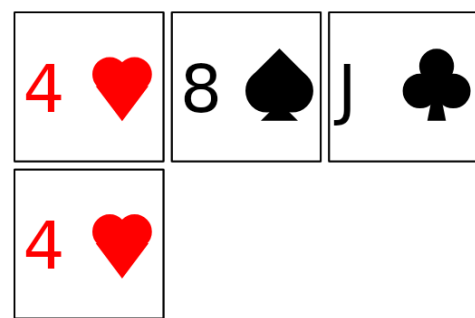
A	2	B	6	C	24
D	4	E	12		

- 53** What is the value of this factorial expression?

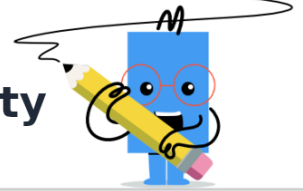
$$\frac{1}{3!}$$

A	20	B	1
C	$\frac{1}{6}$	D	$\frac{1}{3}$

- 52** How many distinct ways can these cards be ordered? Show as a multiplication.



A	$\frac{4 \cdot 3 \cdot 2}{2 \cdot 2}$	B	$\frac{4 \cdot 3 \cdot 2}{2 \cdot 3 \cdot 2}$
C	$\frac{4 \cdot 3 \cdot 2}{4 \cdot 3 \cdot 2 \cdot 1}$	D	$\frac{4 \cdot 3 \cdot 2}{2}$
E	$\frac{3 \cdot 2}{2}$		



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54 What is the value of this factorial expression?

$$\frac{1}{4! \cdot 2!}$$

A	$\frac{1}{48}$	B	36
C	$\frac{3}{4}$	D	$\frac{1}{8}$

55 What is the value of this factorial expression?

$$\frac{1}{(4-2)!}$$

A	1	B	60
C	$\frac{1}{2}$	D	$\frac{1}{48}$

56 What is the value of this factorial expression?

$$\frac{1}{2! \cdot (2-2)!}$$

A	3	B	$\frac{1}{2}$
C	$\frac{1}{4}$	D	$\frac{1}{24}$

57 What is the value of this factorial expression?

$$\frac{5!}{5! \cdot 2!}$$

A	20	B	$\frac{1}{240}$
C	$\frac{1}{2}$	D	$\frac{1}{10}$
E	120		

58 What is the value of this factorial expression?

$$\frac{8! + 6!}{6!}$$

A	102	B	87
C	67	D	27
E	57		

59 What is the value of this factorial expression?

$$\frac{4!}{(4-2)!}$$

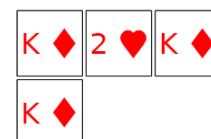
A	1	B	12
C	24		

60 What is the value of this factorial expression?

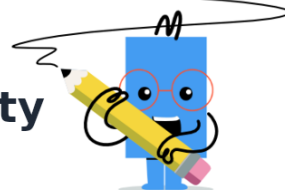
$$\frac{4!}{3! \cdot (5-3)!}$$

A	4	B	24	C	12
D	$\frac{1}{240}$	E	2		

61 How many distinct ways can these cards be ordered?

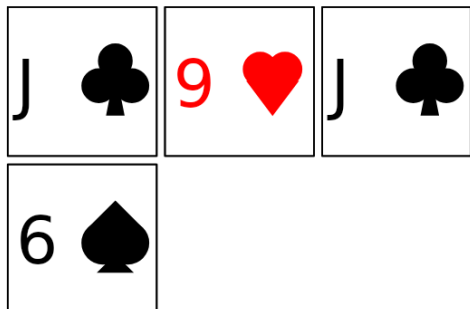


A	4	B	2	C	13
D	14	E	0	F	6



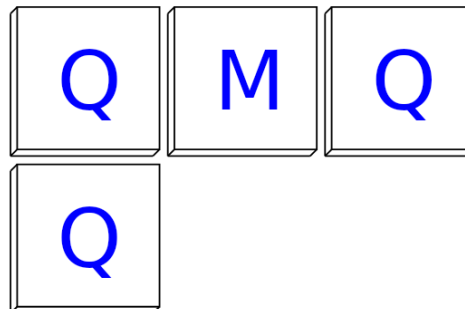
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62 How many distinct ways can these cards be ordered? Show as a factorial.



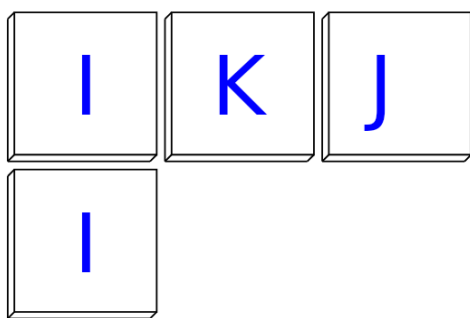
- | | | | |
|---|-----------------|---|--------------------------|
| A | $\frac{4!}{2!}$ | B | $\frac{4!}{4! \cdot 0!}$ |
| C | $\frac{4!}{3!}$ | D | $\frac{6!}{3! \cdot 2!}$ |
| E | $\frac{3!}{2!}$ | | |

63 How many distinct ways can these letter tiles be ordered? Show as a multiplication.



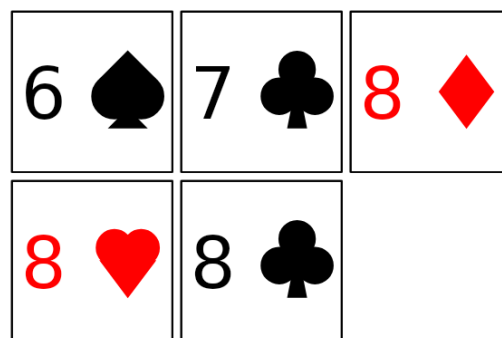
- | | | | |
|---|---|---|---|
| A | $\frac{5 \cdot 4 \cdot 3 \cdot 2}{3 \cdot 2}$ | B | $\frac{5 \cdot 4 \cdot 3 \cdot 2}{3 \cdot 2 \cdot 3 \cdot 2}$ |
| C | $\frac{4 \cdot 3 \cdot 2}{3 \cdot 2 \cdot 2}$ | D | $\frac{4 \cdot 3 \cdot 2}{4 \cdot 3 \cdot 2 \cdot 1}$ |
| E | $\frac{4 \cdot 3 \cdot 2}{3 \cdot 2}$ | F | $\frac{3 \cdot 2}{3 \cdot 2}$ |

64 How many distinct ways can these letter tiles be ordered? Show as a factorial.

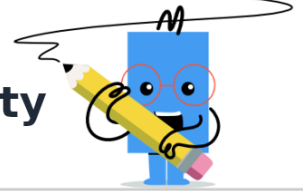


- | | | | |
|---|--------------------------|---|--------------------------|
| A | $\frac{4!}{4! \cdot 0!}$ | B | $\frac{4!}{3!}$ |
| C | $\frac{3!}{2!}$ | D | $\frac{4!}{2!}$ |
| E | $\frac{4!}{2! \cdot 3!}$ | F | $\frac{4!}{2! \cdot 2!}$ |

65 How many ways can these cards be arranged to still be arranged smallest to largest? Show as a multiplication.

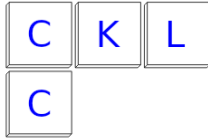


- | | | | |
|---|-------------------------------|---|-----------------------------|
| A | $3 \cdot 2 \cdot 2$ | B | $3 \cdot 2$ |
| C | $4 \cdot 3 \cdot 2$ | D | $3 \cdot 2 \cdot 3 \cdot 2$ |
| E | $\frac{1}{3 \cdot 2 \cdot 1}$ | F | $5 \cdot 4 \cdot 3 \cdot 2$ |



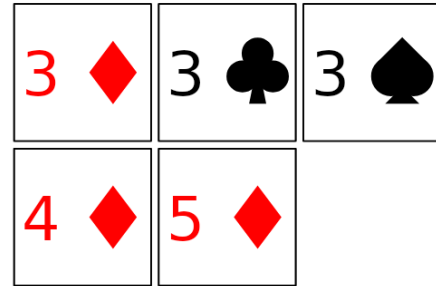
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66 How many distinct ways can these letter tiles be ordered?



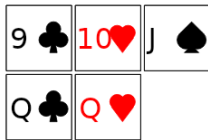
A	7	B	12	C	20
D	0	E	2	F	9

67 How many ways can these cards be arranged to still be arranged smallest to largest? Show as a factorial.



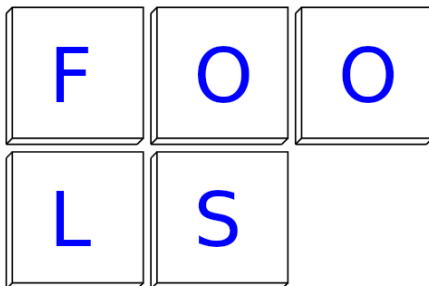
A	$3!$	B	$\frac{1}{3! \cdot 1!}$
C	$3! \cdot 2!$	D	$5!$
E	$3! \cdot 3!$	F	$\frac{2!}{3! \cdot 1!}$

68 How many ways can these cards be arranged to still be arranged smallest to largest?



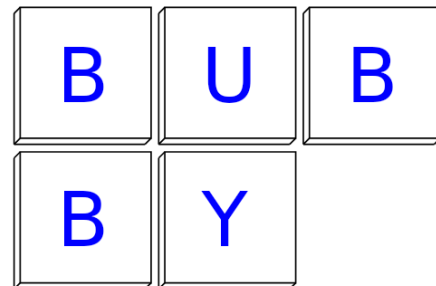
A	24	B	2	C	4
D	12	E	6		

69 How many ways can these letter tiles be ordered to spell 'FOOLS'? Show as a multiplication.

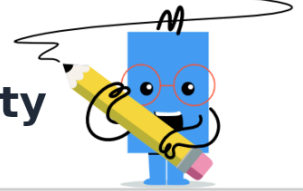


A	2	B	$4 \cdot 3 \cdot 2$
C	$\frac{1}{2 \cdot 1}$	D	$3 \cdot 2$
E	$2 \cdot 2$	F	$\frac{2}{2 \cdot 1}$

70 How many ways can these letter tiles be ordered to spell 'BUBBY'? Show as a factorial.

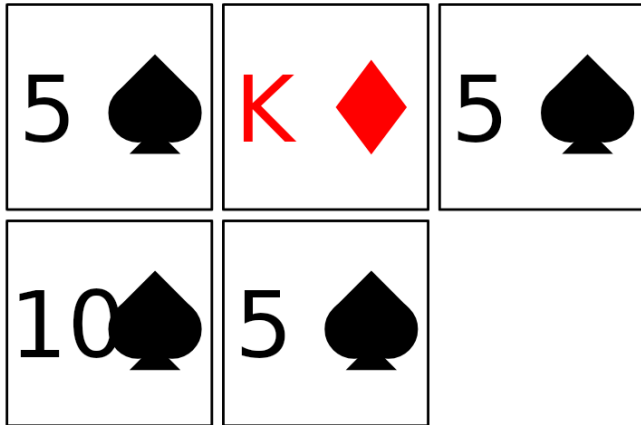


A	$\frac{1}{3! \cdot 1!}$	B	$5!$
C	$\frac{2!}{3! \cdot 1!}$	D	$4!$
E	$3! \cdot 3!$	F	$3!$



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71 How many distinct ways can these cards be ordered? Show as a multiplication.



A

$$\frac{5 \cdot 4 \cdot 3 \cdot 2}{3 \cdot 2}$$

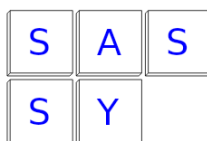
B

$$\frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2}{2 \cdot 3 \cdot 2}$$

C

$$\frac{5 \cdot 4 \cdot 3 \cdot 2}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$$

72 How many ways can these letter tiles be ordered to spell 'SASSY'?



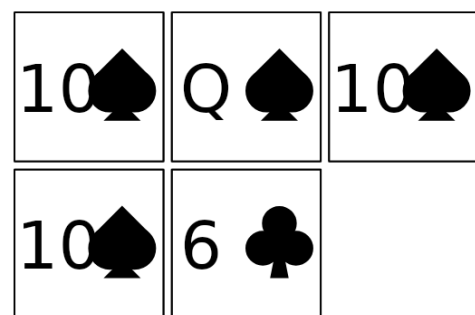
A	120	B	24	C	6
D	12	E	36		

74 How many distinct ways can these cards be ordered?

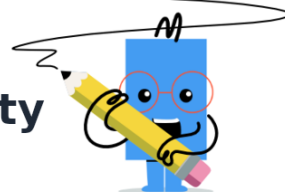


A	7	B	6	C	10
D	30	E	20	F	3

73 How many distinct ways can these cards be ordered? Show as a factorial.

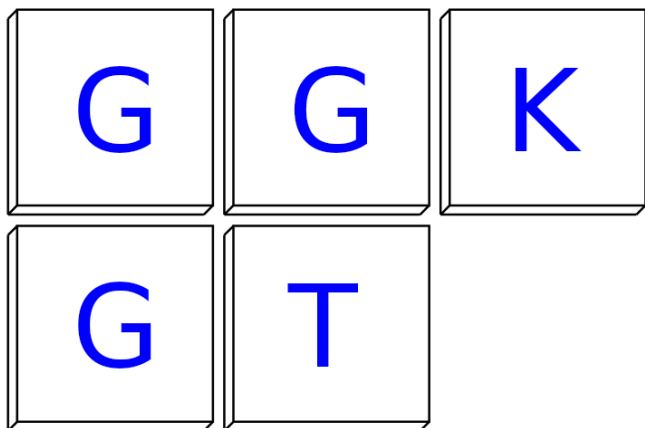


A	$\frac{5!}{5! \cdot 0!}$	B	$\frac{3!}{3!}$
C	$\frac{5!}{3!}$	D	$\frac{4!}{3!}$
E	$\frac{5!}{4!}$	F	$\frac{5!}{5!}$



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75 How many distinct ways can these letter tiles be ordered? Show as a multiplication.



A

$$\frac{5 \cdot 4 \cdot 3 \cdot 2}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$$

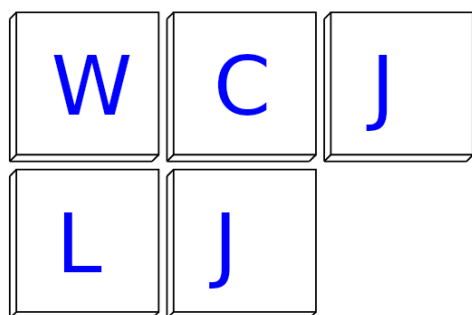
B

$$\frac{5 \cdot 4 \cdot 3 \cdot 2}{3 \cdot 2}$$

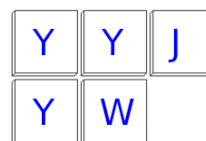
C

$$\frac{5 \cdot 4 \cdot 3 \cdot 2}{3 \cdot 2 \cdot 3 \cdot 2}$$

76 How many distinct ways can these letter tiles be ordered? Show as a factorial.



77 How many distinct ways can these letter tiles be ordered?



A	8	B	0	C	20
D	10	E	9	F	14

78 Select the correct formula for this notation

$${}_3\text{C}_2$$

A $\frac{2!}{3! \cdot 1!}$

B $\frac{3!}{2! \cdot 1!}$

C $\frac{3!}{1!}$