

## Combinations

**List all possible combinations.**

1) T, V, W, taken two at a time

2) A, B, C, D, taken two at a time

3) ☺, ☀, ♥, ▲, taken three at a time

4) 4, 5, 6, 7, taken four at a time

**Evaluate each expression.**

5)  ${}_{22}C_{20}$

6)  ${}_{11}C_8$

7)  ${}_{12}C_8$

8)  ${}_{25}C_{23}$

9)  ${}_{24}C_5$

10)  ${}_{17}C_{10}$

11)  $4 \cdot {}_{18}C_{11}$

12)  ${}_{20}C_{16} + 1$

13)  $\frac{{}_{20}C_5}{8}$

14)  $-6 + {}_{19}C_5$

**Critical thinking questions:**15) Explain why  ${}_nC_2 = {}_nC_{n-2}$ 

16) Write a combination that equals 12345

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**List all possible combinations.**

1) T, V, W, taken two at a time

TV VW  
TW

2) A, B, C, D, taken two at a time

AB BC  
AC BD  
AD CD

3) ☺, ☀, ♥, ▲, taken three at a time

☺☀♥ ☀♥▲  
☺☀▲  
☺♥▲

4) 4, 5, 6, 7, taken four at a time

4567

**Evaluate each expression.**

5)  ${}_{22}C_{20}$

231

6)  ${}_{11}C_8$

165

7)  ${}_{12}C_8$

495

8)  ${}_{25}C_{23}$

300

9)  ${}_{24}C_5$

42,504

10)  ${}_{17}C_{10}$

19,448

11)  $4 \cdot {}_{18}C_{11}$

127,296

12)  ${}_{20}C_{16} + 1$

4,846

13)  $\frac{{}_{20}C_5}{8}$

1,938

14)  $-6 + {}_{19}C_5$

11,622

**Critical thinking questions:**15) Explain why  ${}_nC_2 = {}_nC_{n-2}$ Choosing  $n - 2$  means two are being left behind.  
You could think of it choosing those two.

16) Write a combination that equals 12345

 ${}_{12345}C_1$