

Answers to Permutations and Combinations Worksheet

1. (a) ${}_6P_2 = 6 \cdot 5 = 30$
(b) $6 \cdot 6 = 36$
2. (a) $4 \cdot 5 \cdot 2 = 40$
(b) $5 \cdot 6 \cdot 3 = 90$
3. $5^{15} = 30,517,578,125$
4. (a) ${}_6P_6 = 6! = 720$
(b) $({}_6C_2) \cdot ({}_4C_2) \cdot ({}_2C_2) = 15 \cdot 6 \cdot 1 = 90$
(c) $({}_6C_3) \cdot ({}_3C_3) = 20 \cdot 1 = 20$
(d) $({}_6C_3) \cdot ({}_3C_2) \cdot ({}_1C_1) = 20 \cdot 3 \cdot 1 = 60$
5. (a) ${}_5P_5 = 5! = 120$
(b) $120 - 4 \cdot 2 \cdot 3! = 72$
6. $\frac{8!}{8} = 7! = 5040$
7. ${}_5P_5 = 5! = 120$
8. $({}_5C_2) \cdot ({}_3P_3) = ({}_5C_2) \cdot (3!) = 10 \cdot 6 = 60$
9. $({}_{10}C_5) \cdot ({}_5C_4) \cdot ({}_1C_1) = 252 \cdot 5 \cdot 1 = 1260$
10. $({}_8C_3) \cdot ({}_5C_4) \cdot ({}_1C_1) = 56 \cdot 5 \cdot 1 = 280$
11. (a) $2^{20} = 1,048,576$
(b) ${}_{20}C_7 = 77,520$
(c) ${}_{20}C_{10} = 184,756$
12. (a) ${}_7C_2 = 21$
(b) ${}_4C_2 = 6$
(c) $({}_3C_1) \cdot ({}_4C_1) = 3 \cdot 4 = 12$
13. $({}_4C_2) \cdot ({}_7C_3) \cdot ({}_3C_1) = 6 \cdot 35 \cdot 3 = 630$
14. $3^{10} = 59,049$
15. $5^6 = 15,625$