Practice Factorials and Double Factorials

Name:_____   Date:_____

1. Find 7!

2. Find 7!!

3. Find 9!/(5!2!)

4. Find(2023!)/(2022!)

5.   Find 5!! X 3!!

6.   Find (9!!)/(3!!)

7.   Find (10!)/(4!!)

Answer Key

1. 5040

7! = 7 x 6 x 5 x 4 x 3 x 2 x 1 = 5040

2. 105

7!! = 7 x 5 x 3 x 1 = 105

*Remember that you must multiply every other term in a double factorial

3. 1512

$$9!/(5!2!) = \frac{9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{(5 \times 4 \times 3 \times 2 \times 1)(2 \times 1)}$$

$$9!/(5!2!) = \frac{9 \times 8 \times 7 \times 6 \times \cancel{5} \times \cancel{4} \times \cancel{3} \times \cancel{2} \times \cancel{1}}{(\cancel{5} \times \cancel{4} \times \cancel{3} \times \cancel{2} \times \cancel{1})(2 \times 1)}$$

$$9!/(5!2! = \frac{9 \times 8 \times 7 \times 6}{(2 \times 1)} = 9 \times 8 \times 7 \times 3$$

$$9!/(5!2!) = 1512$$

4. 2023

Similarly to problem 3, we can reduce 2023!/2022! into 2023 because 2022! appears in the numerator(top) and denominator(bottom).

$$\frac{2023 \times 2022 \times 2021 \times \ldots \times 2 \times 1}{2022 \times 2021 \times \ldots \times 2 \times 1}$$

5. 45

5!! = 5 x 3 x 1

3!! = 3 x 1

5!!(3!!) = 5 x 3 x 3 = 45

6. 315

9!! = 9 x 7 x 5 x 3 x 1

3!! = 3 x 1

$$(9!!)/(3!!) = \frac{9 \times 7 \times 5 \times \cancel{3} \times \cancel{1}}{\cancel{3} \times \cancel{1}}$$

(9!!)/(3!!) = 315

7. 453600

10! = 10 x 9 x 8 x 7 x 6 x 5 x 4 x 3 x 2 x 1

4!! = 4 x 2 x 1

$$(10!)/(4!!) = \frac{10 \times 9 \times 8 \times 7 \times 6 \times 5 \times \cancel{4} \times 3 \times \cancel{2} \times 1}{\cancel{4} \times \cancel{2}}$$

(10!)/(4!!) = 453600