

OBJECTIVE: Students will be able to compute factorials and solve problems involving object ordering.

CHECKPOINT:

A train has an engine, a caboose, and 7 passenger cars. The engine must go in front, and the caboose must come last, but the 7 passenger cars can be arranged in any order. In how many different orders can the cars of the train be arranged?

REACH:

A password is to be created beginning with the letters A, B, C, in any order, and finishing with the numbers 1, 2, 3, 4 in any order. How many different passwords can be made in this way?

- 1 A 4-character password is to be created from the letters **W-X-Y-Z**.

Create as many different 4-letter passwords as you can using these 4 letters.



SKILL REVIEW

2 Compute: $4!$

3 Compute: $\frac{7!}{4!}$

4 Compute: $\frac{12!}{8! 5!}$

From Lesson 6.01

If you have 4 things to arrange, like the letters W, X, Y, and Z, there are $4!$ ways it can be done.

5 A manager of a baseball team must decide the order in which his nine players will bat. He knows the pitcher will bat last. How many different batting lineups are possible?

- 6** The FIVE starting players on a basketball team are going to be announced one at a time, but they are arguing about the order in which each will be announced. They decide to randomly pick the order in which they will take the court. **How many different orders are possible?**
- 7** **Create a diagram or list to display all the possible ways these FIVE players can be announced.**

PRACTICE

Compute each factorial.

8 $2!$

9 $3!$

10 $4!$

11 $5!$

12 $\frac{6!}{3!}$

13 $\frac{10!}{7!}$

14 $\frac{22!}{12! 14!}$

15 Six swimmers were competing in a race. In how many different orders can these SIX swimmers finish?

LOOKING AHEAD

16 Of these SIX swimmers, first, second, and third place win Gold, Silver, and Bronze medals. How many different 1st, 2nd, and 3rd place arrangements are possible?

(Create a Diagram)

CONCLUSION

- 17** Describe any shortcuts you could use to evaluate the factorial expression shown.

$$\frac{14!}{7! 6!}$$

CONCLUSION

- 18** Sharon is going to make a 4-letter PIN using just **FOUR** of the letters shown below.

A-B-C-D-E-F-G

How many different PINs can Sharon make?

Instructional Objectives

Standard 18.0.2

Students will be able to compute factorials and solve problems involving object ordering.

Were you 100% focused and engaged during today's lesson?

Yes

No

%

Rate your understanding of the instructional objective.

4

completely understand

3

mostly understand

2

understand a little

1

a bit confused

0

completely confused

Please take a minute to help me gauge your understanding by answering the following question.

How many different ways can the letters A-B-C-D-E be arranged?

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