

Home: 82

page 640-641 #9-23 odd 25-30, 31-47 odd

Date: 1/13<http://www.mathvizza.com>Bell WorkDirections: For the following experiments, please:

1. determining how many events make up the experiment
2. determine the number of outcomes that are possible for each event
3. determine the number of possible outcomes there are for the experiment.

A. Flipping a coin, picking a letter out of the consonants and spinning spinner labeled 1-9.

A. 3 events.

B

$E_1 \rightarrow 2$

$E_2 \rightarrow 26 - 5 = 21$

$E_3 \rightarrow 9$

$$C. E = 2 \cdot 21 \cdot 9$$

$$= 378$$

B. Picking 4 cards from 4 different standard poker decks

A. 4 events

$$E_1 \quad S_2$$

$$E_2 \quad S_2$$

$$E_3 \quad S_2$$

$$E_4 \quad S_2$$

Objectives

1. The students will comprehend **permutations**.
2. The students will use permutations to **count the possible** outcomes of arranging **n** objects in a line.
3. The students will use permutations to count that number of arrangements for n objects when some of the objects repeat.
4. The students will compute the permutation of **n objects taken r at a time**.
5. The students will compute a permutation of n objects arranged in a **circle**.

Permutations

Permutation - number of ^{distinct} ways to Arrange a number of objects where order matters

Permutations for n objects in a line

$$n!$$

Permutations for n objects with repeated objects

$$\frac{n!}{d_1! d_2! \dots d_k!}$$

d number of repeats

where d is the numbers of times an object repeats

Permutations for n objects taken r at a time

$$\frac{n!}{(n-r)!}$$

Permutation of n objects arranged in a circle

$$(n-1)!$$

$$\frac{n!}{d_1! d_2! \dots d_x!}$$

Mississippi

$$\frac{11!}{(4! 4! 2!)} \cdot$$

i s p

Permutations for n objects

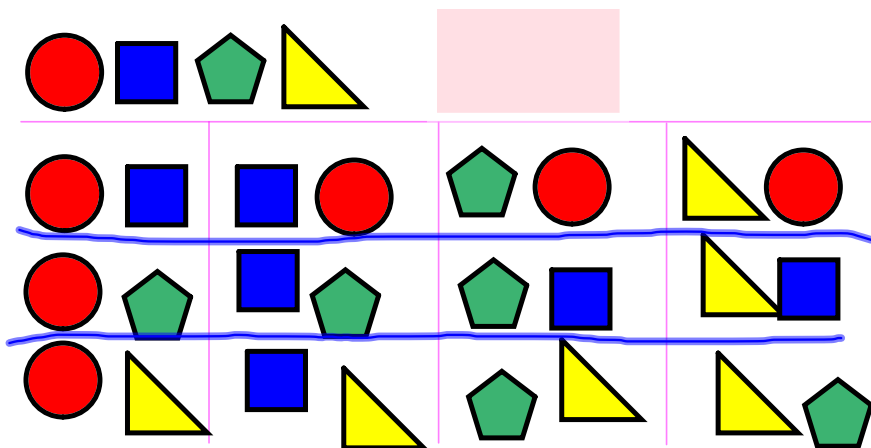
How many ways can you arrange 8 students in a line?

$$8! = 40,320$$

Permutations for n objects

taken r at a time

How many ways can you arrange the following 4 shapes selecting 2 at a time?

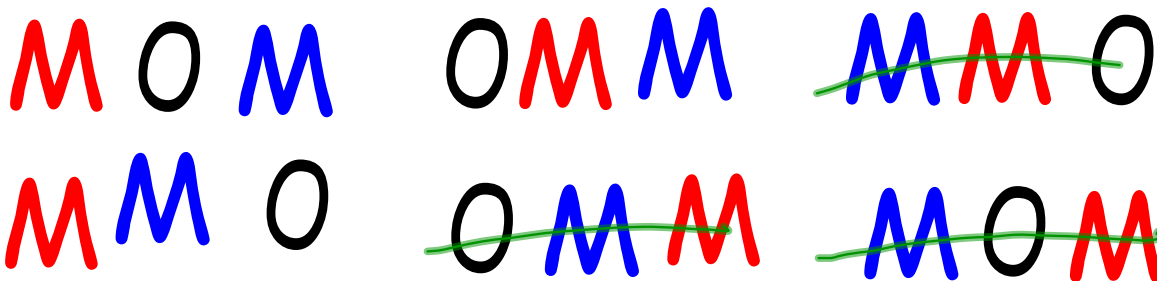


$$\frac{4!}{(4-2)!}$$

$$\frac{4!}{2!} = \frac{4 \cdot 3 \cdot \cancel{2} \cdot \cancel{1}}{\cancel{2} \cdot \cancel{1}} = 12$$

Permutations for n objects
with repeated objects

How many ways can you arrange the letters in the word MOM?



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

Permutation of n object
arranged in a circle

How many ways can 6 people sit in a circle?

Examples from the Homework

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In how many ways can a teacher arrange 6 students in the front row of a classroom with the following number of students?

#36. 24

$${}_{24}P_6$$

$$\frac{24!}{(24-6)!} = \frac{24!}{18!} = 24 \cdot 23 \cdot 22 \cdot 21 \cdot 20 \cdot 19$$

#38. 30

$${}_{30}P_6$$

Find the number of permutations of the letters in each word.

#40 pencil

$$6!$$

#41 trout

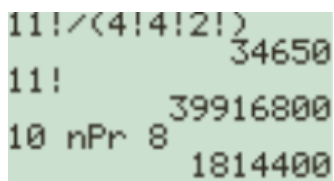
$$\frac{5!}{2! \cdot 1!}$$

On your Calculator

In your homework, you may do any problem between
17-24 on your calculator.

$${}_{10}P_8$$

$$\frac{{}_{10}P_6}{{}_{10}P_2}$$



Calculator screen showing calculations for permutations:

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11!/(4!4!2!) 34650
11!           39916800
10 nPr 8     1814400
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