9:28 AM

# Math 9 Enriched

## Permutations

Name	Date
Name	Date

Using each of the digits 2, 5, 7, and 8 once in each number, how many different four-digit numbers can be formed?

$$\frac{4 \times 3 \times 2 \times 1}{24}$$

If the B and the E must remain in their original positions, in how many different ways can the letters in the word BALUTINGRE be arranged?

In how many different ways can the letters in the word TEST be scrambled?

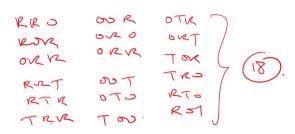
In how many different ways can the letters in the ways 
$$\sim 10^{-1}$$
  $\sim 10^{-1}$   $\sim 10^{-1}$ 

A four-letter sequence is formed by rearranging the letters in the word "math". How many such different sequences are possible?

$$MATM \Rightarrow 4 \times 3 \times 2 \times )$$

$$= 24$$

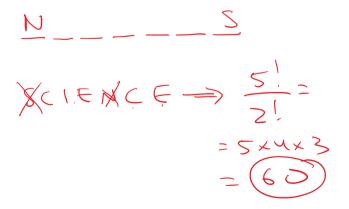
5. The 5 letters of the word ROTOR are place on separate pieces of paper. By choosing 3 of these pieces of paper, how many distinct 3-letter arrangements can be made?



6. How many distinct arrangements of the letters in the word CHAIR are possible?

7. The letters in the word COUNTS are to be written down in some order from left to right. In how many different ways can this be done?

8. How many different arrangements of the letters of the word SCIENCE have N as their first letter and S as their last?



#### Page 3

- How many different ways can the five letters of the word STATE be scrambled if the two T's cannot be
- 2 mays: "USE comprement" DT = T = T = T. 5 - 4 T\_\_\_T , 6 way>
  T\_\_\_T , 6 way>
  T\_\_\_T , 6 way> = 5x4x3 - 24 = 60 -24 10. How many different ways can the letters of the word FOUR be scrambled so that the first letter is a vowel
  - and the last letter is a consonant?

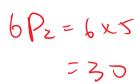
$$= \frac{1}{2} \times 1 \times 2 = 3$$

11. How many ways could 8 different students be selected for president, vice-president and treasurer of a club if each student holds exactly one office?

12. In how many ways can 4 students from a group of 9 be seated in a row of 4 chairs?

72			ı
	40	2_	7.55
30	2600	140	220
2	80	4	3024
	•		

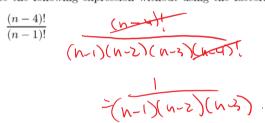
13. How many 2-letter permutations are there using the letters in the word NUMBER?



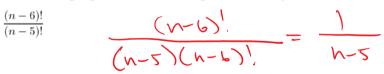
14. A softball all-star team is introduced with the catcher first and the pitcher last. If there are 9 players altogether, how many ways can the remaining team members be introduced between the catcher and the pitcher?



15. Write the following expression without using the factorial symbol.



16. Write the following expression without using the factorial symbol.



17. Solve for 
$$n$$
.

for n.

$$P_{2} = 20$$

$$-2 \text{ spaces}$$

$$\frac{h \times (n-1)}{5 \times 4} = 20$$

$$\frac{h \times (n-1)}{(n-2)!} = 20$$

$$h = 20$$

$$\frac{h \cdot (n-2)!}{(n-2)!} = 20$$

$$h \cdot (n-2)! = 20$$

$$h \cdot (n-2)! = 20$$

$$\frac{h}{h} = \frac{h!}{(h-y)!} = 20$$

$$\frac{h!}{(h-y)!} = 20$$

$$h(y-1) = 20$$

$$h^{2} - h = 20$$

## 18. Solve for r.

$$\int_{7P_r=840}^{4P_r=840}$$

$$\frac{7!}{(7-1)!} = 840$$

$$\frac{7!}{840} = (7-1)!$$

$$6 = (7-1)!$$

$$3! = (7-1)!$$

$$3 = 7 - (7-1)!$$

19. Solve for 
$$n$$
.

$$_{n}P_{4} = 360$$

$$n \times (n-1) \times (n-2) \times (n-3) = 360$$
 or  $\frac{n!}{(n-4)!} = 360$ 

$$\frac{n!}{(n-4)!} = 360$$

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 ${\rm Math}\ 9\ {\rm Enriched} \qquad {\rm Permutations} \qquad {\rm Mr.\ Young} \qquad 03/06/2010$ 

#### Answer List

1.	24	(numbers)

4. 24 (sequences)

7. 720 (ways)

10. 8 (ways)

13. 30

10. 00

16.  $\frac{1}{(n-5)}$ 

19. 6

### 2. 5040 (ways)

5. 18 (arrangements)

8. 30 (arrangements)

11. 8 (ways)

14. 5040

17. 5

#### 3. 12 (ways)

6. 120 (arrangements)

9. 36 (ways)

12. 3024

15.  $\frac{1}{(n-3)(n-2)(n-1)}$ 

18. 4

# Catalog List

1. MCC EC 1

4. MCC EC 35

7. MCC EC 109

10. MCC EC 135

13. AW3 FB 6

16. AW3 FB 40

19. AW3 FB 31

2. MCC EC 21

5. MCC EC 33

8. MCC EC 150

11.

14. AW3 FB 16

17. AW3 FB 30

3. MCC EC 12

6. MCC EC 99

9. MCC EC 142

12. AW3 FB 21

15. AW3 FB 38

18. AW3 FB 34