

**Math 112 - Quiz 11**

November 22, 2017

Name Key

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary.

1. (2 points) Carl wants to purchase a car. He has decided to select a car from one of 3 different makes, where each make comes in 3 different models and 4 different colors. How many different choices does Carl have?

$$3 \times 3 \times 4 = \boxed{36}$$

2. (3 points) The single digits 1-9 are used to form a 3-digit code.

(a) How many possible codes are there if digits cannot be reused?

$$9 \times 8 \times 7 = \boxed{504} \quad \text{-or-} \quad {}_9P_3 = 504$$

(b) How many possible codes are there if digits can be reused?

$$9 \times 9 \times 9 = \boxed{729}$$

3. (3 points) Compute each of the following.

(a)  $8!$

$$8 \times 7 \times 6 \times \dots \times 1 = \boxed{40,320}$$

(b)  $\frac{200!}{197!}$

$$= \frac{200 \times 199 \times 198 \times \cancel{197!}}{\cancel{197!}} = 200 \times 199 \times 198$$

$$= \boxed{7,880,400}$$

4. (2 points) List two different permutations of  $(a, b, c, d)$ . How many different permutations are there?

$(a, b, d, c)$

$(c, a, d, b)$

$$4 \times 3 \times 2 \times 1 = \boxed{24} \text{ TOTAL}$$

PERMUTATIONS.