Name _____ *Key* _____   Date: March 22

Math 7 Honors   Practice Counting Principle

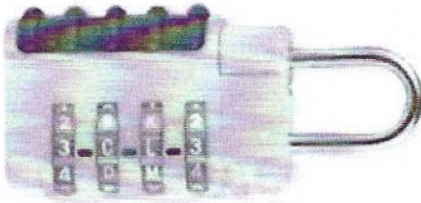**Directions:** *Use the Fundamental Counting Principle to answer each question.*

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1. The combination lock shown has 4 wheels.

Wheel 1: 0-9

Wheel 2: A-J

Wheel 3: K-T

Wheel 4: 0-9

How many possible combinations are there?

$$\underset{\substack{1st\\\#}}{10} \cdot \underset{\substack{2nd\\\#}}{10} \cdot \underset{\substack{3rd\\\#}}{10} \cdot \underset{\substack{4th\\\#}}{10} =$$

$$10^4 = 1000 \text{ outcomes}$$

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2. Each student at Hills Village Middle School is given a 5-digit identification number using the digits 1-9.

Part A How many different ID numbers are possible?

$$\underset{\substack{1st\\\#}}{9} \cdot \underset{\substack{2nd\\\#}}{9} \cdot \underset{\substack{3rd\\\#}}{9} \cdot \underset{\substack{4th\\\#}}{9} \cdot \underset{\substack{5th\\\#}}{9}$$

$$= 9^5 = 59,049 \text{ outcomes}$$

Part B If none of the 5-digits could repeat, how many ID numbers are possible.

$$9 \cdot 8 \cdot 7 \cdot 6 \cdot 5$$

$$= 15,120 \text{ outcomes}$$

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3. At Grant's Ice Cream shop you can choose between vanilla, chocolate, and strawberry ice cream. The different toppings are caramel, sprinkles, and chocolate syrup, and you can also choose between a waffle cone and sugar cone. How many different combinations of one ice cream, one topping, and one cone can be created?

$$\underset{\substack{ice\\cream}}{3} \cdot \underset{topping}{3} \cdot \underset{cone}{2} = 18 \text{ outcomes}$$

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4. From a group of 5 candidates, a committee of 3 people is selected. How many different ways can the committee be selected?

$$\underset{\substack{1st\\pick}}{5} \cdot \underset{\substack{2nd\\pick}}{4} \cdot \underset{\substack{3rd\\pick}}{3}$$

$$= 60 \text{ outcomes}$$

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5. A New York State license plate uses a 7-character code. The first three characters are letters of the alphabet, but do not include I, O, or Q. The next 4 characters use the digits 0-9. Determine the total number of possible combinations for a license plate if the characters are allowed to repeat.

26 letters minus 3

NEW YORK

GAP · 4563

EMPIRE STATE

$$\underset{\substack{letters\\except\\I,O,Q}}{23} \cdot \underset{letters}{23} \cdot \underset{letters}{23} \cdot 10 \cdot 10 \cdot 10 \cdot 10$$

$$23^3 \cdot 10^4$$

$$12167 \cdot 10000 = 121,670,000 \text{ outcomes}$$