

## ACT-Like Math Questions

### Topic: Combined Probabilities Using Multiplication

#### Calculator Permitted

#### Easy:

1.) You roll two 6-sided number cubes. What is the probability the first cube will show a 6 and the second cube will show a 2? (HINT: this is a combination problem, so calculate the two probabilities separately, then multiply them.)

A.  $\frac{1}{36}$

B.  $\frac{1}{18}$

C.  $\frac{1}{6}$

D.  $\frac{1}{3}$

E. 2

2.) Edward has a bag with three marbles in it. One is red, one blue, one orange. If he randomly selects two marbles without replacing them, what is the probability he selects first the orange then the blue? (HINT: this is a without replacement problem, so use  $P(\text{orange})=1/3$  and  $P(\text{blue})=1/2$ )

A.  $\frac{1}{9}$

B.  $\frac{1}{8}$

C.  $\frac{1}{6}$

D.  $\frac{2}{9}$

E.  $\frac{2}{3}$

**Medium:**

1.) An 18 member committee has 4 officers. The committee needs a non-officer to take notes during the meetings and decides to select someone randomly. If Louis is a member of the committee, but NOT an officer, what is the probability that he will be selected to take notes?

A. 0

B.  $\frac{1}{14}$

C.  $\frac{1}{6}$

D.  $\frac{1}{18}$

E.  $\frac{1}{4}$

2.) You are playing a game that uses a deck of 20 cards numbered 1-20. The first four cards you draw are numbered 4, 12, 17, and 20. You do NOT return them to the deck. What is the probability that the next card you draw is numbered 5?

A. 0

B.  $\frac{1}{5}$

C.  $\frac{1}{20}$

D.  $\frac{1}{16}$

E.  $\frac{5}{16}$

3.) You are playing a game that uses a deck of 20 cards numbered 1-20. The first four cards you draw are numbered 4, 12, 17, and 20. You do NOT return them to the deck. What is the probability that the next card you draw is numbered 12?

A. 0

B.  $\frac{1}{5}$

C.  $\frac{1}{20}$

D.  $\frac{1}{16}$

E.  $\frac{5}{16}$

4.) Nikhil, Sarai, and 10 other people are members of community planning committee. The committee decides to select a president and vice president randomly from its 12 members. What is the probability that Nikhil will be president and Sarai will be vice president?

A.  $\frac{1}{132}$

B.  $\frac{1}{144}$

C.  $\frac{1}{72}$

D.  $\frac{1}{6}$

E.  $\frac{11}{12}$

**Challenge:**

1.) Comal's drawer has 20 socks in it: 10 white socks, 4 black socks, 4 blue socks, and 2 red socks. If Comal randomly takes two socks out of the drawer, what is the probability they will be the same color? Round your answer to the nearest thousandth.

A. 0.003

B. 0.100

C. 0.237

D. 0.305

E. 0.500

2.) Naugatuck Savings Bank requires its customers to select a four digit PIN code to access their accounts. Furthermore, the first digit cannot be 0 and the last digit must be even. If Sharri is a customer at Naugatuck Savings Bank, what is the probability she has the PIN 8564?

A.  $\frac{1}{10000}$

B.  $\frac{1}{6561}$

C.  $\frac{1}{4500}$

D.  $\frac{4}{6561}$

E.  $\frac{8564}{9999}$

**Answer Key:**

Easy

1.) A

2.) C

Medium

1.) B

2.) D

3.) A

4.) A

Challenge

1.) D

2.) C



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