

Name: _____

Show work needed to justify your answer.

Date: _____

HW: # 32b: Math IBSL - Standard 30 - Theoretical and Experimental Probability

5 points

1 Here are some events relating to throwing two dice:

A: Both dice show a 4.

B: The total is 7 or more.

C: There is at least one 6.

D: The two dice show the same number.

E: Both dice are odd.

Which of these pairs of events are mutually exclusive?

a A and B b A and C c A and D

d A and E e B and E f C and D

g B and C

a NO
b YES
c NO
d YES
e NO
f NO
g NO

2 Two events N and M are such that $P(N) = \frac{1}{5}$ and $P(M) = \frac{1}{10}$ and $P(N \cup M) = \frac{3}{10}$. Are N and M mutually exclusive?

yes because

$$P(N \cup M) = P(N) + P(M)$$

$$P(N \cup M) = P(N) + P(M)$$

$$\frac{3}{10} = \frac{1}{5} + \frac{1}{10}$$

$$\frac{3}{10} = \frac{2}{10} + \frac{1}{10} \checkmark$$

3 In an inter-school quiz, the probability of School A winning the competition is $\frac{1}{3}$, the probability of school B winning is $\frac{1}{4}$ and the probability of school C winning is $\frac{1}{5}$. Find the probability that:

- a A or B wins the competition.
- b A, B or C wins the competition.
- c Are there any other schools in the competition? How do you know?

$$P(A) = \frac{1}{3} \quad P(B) = \frac{1}{4} \quad P(C) = \frac{1}{5}$$

$$a) P(A \cup B) = P(A) + P(B)$$

$$\frac{1}{3} + \frac{1}{4} = \boxed{\frac{7}{12}}$$

$$b) P(A \cup B \cup C) = \frac{1}{3} + \frac{1}{4} + \frac{1}{5}$$

$$\frac{20}{60} + \frac{15}{60} + \frac{12}{60} = \boxed{\frac{47}{60}}$$

c) yes because $P(A \cup B \cup C) \neq 1$