Compound Events

**CORE STANDARDS**

HSS.CP.A.2

HSS.CP.A.5

HSS.CP.B.8

LESSON

**7-3**

OBJECTIVE **1. SWBAT find probability of compound events, including independent and mutually**

**exclusive events.**

NOTES

Definition of Independent Events

Events are independent if knowing the outcome of one does not affect the probability that the other will occur.

Equations for Independent Events

These equations work ONLY for independent events, and… if the equations work, then the events MUST be independent.

Definition of Mutually Exclusive Events

Two events that cannot occur at the same time (on the same probability trial).

Equations for Mutually Exclusive Events

These equations work ONLY for mutually exclusive events, and… if the equations work, then the events MUST be mutually exclusive.

EXAMPLES

**1.** Events *A* and *B* are independent. *P*(*A*) = 0.5 and **2.** Events *C* and *D* are mutually exclusive. *P*(*C*) = 0.4

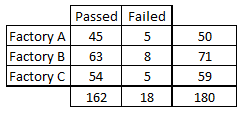
*P*(*B*) = 0.8. Fill in the Venn Diagram appropriately. and *P*(*D*) = 0.3. Fill in the Venn Diagram appropriately.

*A*

*B*

*C*

*D*

**3.** The two-way table below shows counts of parts produced by a company’s three factories, categorized by whether or not they passed inspection. If a part is chosen at random, identify each pair of events as independent, mutually exclusive, or neither.

a) Failed vs. Factory A

b) Passed vs. Factory C

c) Factory A vs. Factory B

*E*

*F*

*G*

0.1

0

0.3

0.2

0

0.2

0.1

0.1

**4.** Using the Venn Diagram at the right…

a) name two events that are independent.

b) name two events that are mutually exclusive.

PRACTICE **7-3** NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[SHOW YOUR WORK]

1. Events *A* and *B* are mutually exclusive with  and . Find .
2. Events *C* and *D* are independent with  and . Find .
3. Events *E* and *F* are independent with  and . Find .
4. Events *G* and *H* are both mutually exclusive and independent with . Find .
5. If , , and . Prove or disprove the independence of *J* and *K*.
6. If , , and . Prove or disprove the independence of *L* and *M*.
7. A local Boy Scout Troop held a fundraiser barbeque. To help leaders plan for next year's barbeque, a record of each customer's order was kept and recorded in the two-way table shown.
   1. Prove or disprove the independence of Water vs. Hamburger.
   2. Prove or disprove the independence of No Drink vs. Hot Dog.
   3. Classify the events No Drink vs. No Food as independent, mutually exclusive or neither.
   4. Which values from the table will be most useful for leaders when planning next year's barbeque?
8. Use the Venn Diagram to classify each pair of events as mutually exclusive, independent or neither. Justify your answer mathematically.

*P*

*Q*

*R*

0

0

0.4

0.3

0.1

0.1

0

0.1

* 1. *P* vs. *Q*
  2. *R* vs. *Q*
  3. *P* vs. *R*