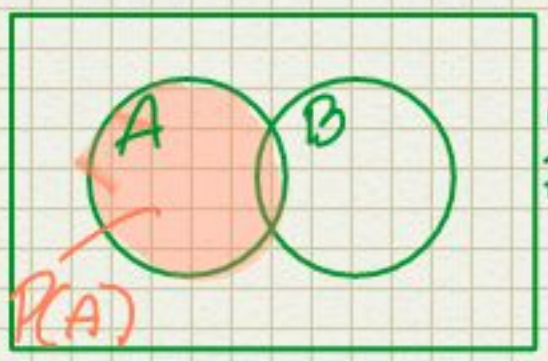
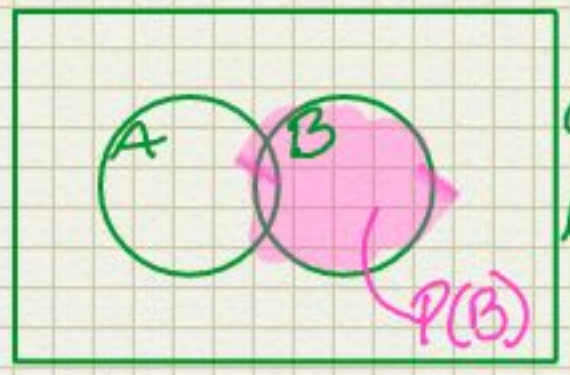
Consider influenza epidemics for two parent heterosexual families. Suppose that the probability is 15% that at least one of the parents has contracted the disease. The probability that the parent has contracted influenza is 10% while that the mother contracted the disease is 9%. What is the probability that the both contracted influenza expressed as a whole number percentage?



ONLY FATHER

A = FATHER

B = MOTHER



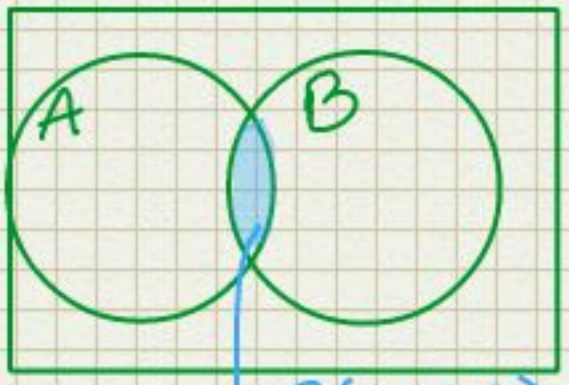
ONLY MOTHER

$P(A) = 0.1$

$P(B) = 0.09$

$P(A \cup B) = 0.15$

$P(A \cap B) = ?$



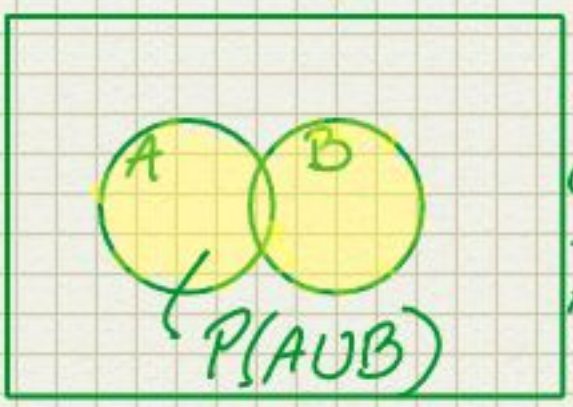
BOTH

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$P(A \cap B) = P(A) + P(B) - P(A \cup B)$

$P(A \cap B) = 0.1 + 0.09 - 0.15$

$P(A \cap B) = 0.04$



ONE, THE OTHER OR BOTH

AT LEAST ONE

$P(A \cap B) = 4\%$

Consider influenza epidemics for two parent heterosexual families. Suppose that the probability is 17% that at least one of the parents has contracted the disease. The probability that the father has contracted influenza is 12% while the probability that both the mother and father have contracted the disease is 6%. What is the probability that the mother has contracted influenza?

$P(A) = 0.12$

$P(B) = ?$

$P(A \cup B) = 0.17$ AT LEAST ONE

$P(A \cap B) = 0.06$ BOTH

A = FATHER

B = MOTHER

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(B) = P(A \cup B) - P(A) + P(A \cap B)$$

$$P(B) = 0.17 - 0.12 + 0.06$$

$$P(B) = 0.11$$

$$\boxed{P(B) = 11\%}$$