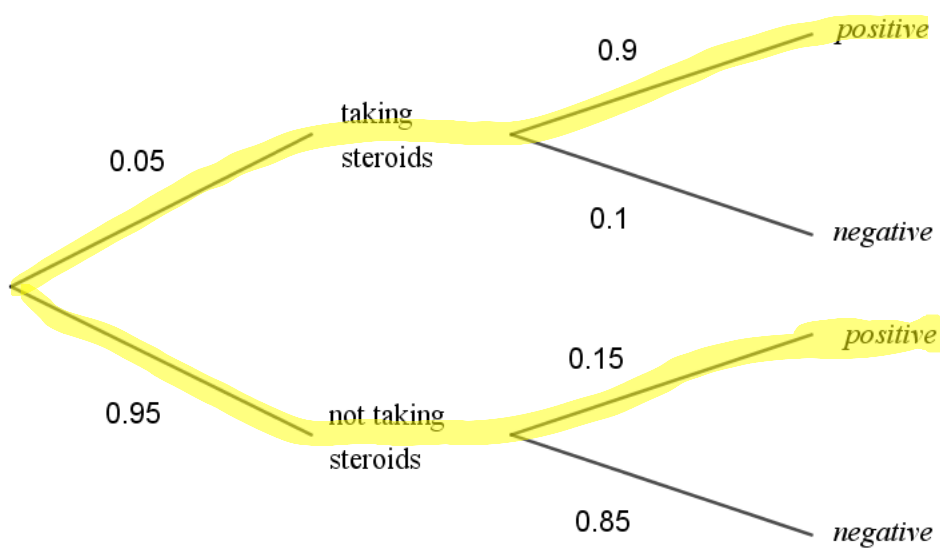In the Olympic Games, it is believed that 5% of sprinters are taking anabolic steroids. A test is developed that gives a positive result for an athlete who **has** taken anabolic steroids in the last month in 90% of cases. The test gives a positive result for an athlete who **has not** taken anabolic steroids in the last month in 15% of cases. A sprinter in chosen at random.

a) Find the probability that she/he tests positive anabolic steroids

b) Given that the athlete tests positive, find the probability that the athlete has taken anabolic steroids in the last month.

Put the information in a tree diagram

a) $P(positive) = 0.05 \times 0.9 + 0.95 \times 0.15$

$$= \mathbf{0.1875}$$

b) $P(taking\ steroids|positive) = \dfrac{P(positive\ AND\ taking\ steroids)}{P(positive)}$

$$= \frac{0.05 \times 0.9}{0.1875}$$

$$= \mathbf{0.24}$$

ONLY 24% or sprinters who have tested positive for anabolic steroids have actually taken them in the last month!