

# AI1103-Assignment-5

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Download all python codes from

<https://github.com/Sravanth-k27/AI1103/tree/main/Assignment-5/codes>

Download latex-tikz codes from

<https://github.com/Sravanth-k27/AI1103/tree/main/Assignment-5/Assignment-5.tex>

UGC/MATH 2018(JUNE MATH SET A )Q.18:

Two students are solving the same problem independently, if the probability of first one solves the problem is  $\frac{3}{5}$  and the probability that the second one solves the problem is  $\frac{4}{5}$ , what is the probability that atleast one of them solves the problem?

- (A)  $\frac{17}{25}$  (C)  $\frac{21}{25}$   
 (B)  $\frac{19}{25}$  (D)  $\frac{23}{25}$

SOLUTION UGC/MATH 2018(JUNE MATH SET A )Q.18::

Let X,Y be two events representing solving the problem by students A,B respectively.  
 Given

$$\Pr(X) = \frac{3}{5} \quad (0.0.1)$$

$$\Pr(Y) = \frac{4}{5} \quad (0.0.2)$$

Since students solve the problem independently, So events X and Y are independent, For independent events

$$\Pr(XY) = \Pr(X) \times \Pr(Y) \quad (0.0.3)$$

from (0.0.1) and (0.0.2)

$$\Pr(XY) = \frac{3}{5} \times \frac{4}{5} \quad (0.0.4)$$

$$\Pr(XY) = \frac{12}{25} \quad (0.0.5)$$

Now we have to find probability of solving the problem by atleast one of them i.e  $\Pr(X + Y)$ .  
 As,

$$\Pr(X + Y) = \Pr(X) + \Pr(Y) - \Pr(XY) \quad (0.0.6)$$

from (0.0.1), (0.0.2), (0.0.5)

$$\Pr(X + Y) = \frac{3}{5} + \frac{4}{5} - \frac{12}{25} \quad (0.0.7)$$

$$\Pr(X + Y) = \frac{23}{25} \quad (0.0.8)$$

Hence the required probability is  $\frac{23}{25}$

**$\therefore$  Option D is correct**