Question 1: Let the tangents drawn from the origin to the circle $x^2 + y^2 - 8x - 4y + 16 = 0$ touch it at the point A and B. The $(AB)^2$ is equal to

(a) 32/5 (b) 64/5 (c) 52/5 (d) 56/5

Answer: (b)

Solution:

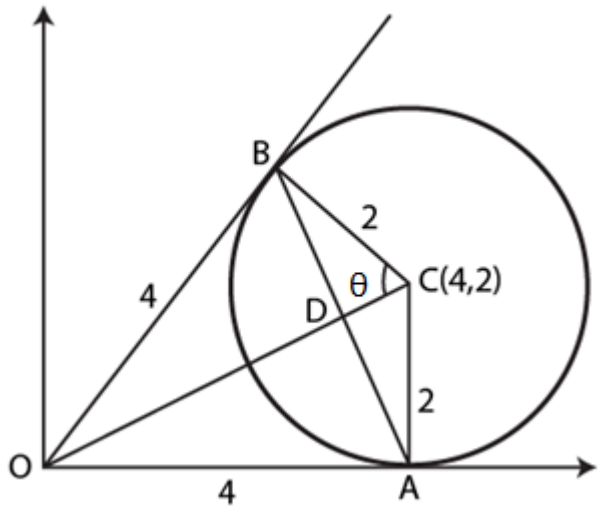
$x^2 + y^2 - 8x - 4y + 16 = 0$

Rearranging above equation, we get

$(x - 4)^2 + (y - 2)^2 = 4$

Centre = (4, 2) and

Radius = 2



OA = OB = 4

In triangle, OBC,

$\tan\theta = 4/2 = 2$

and $\sin\theta = 2/\sqrt{5}$

In triangle, BDC

$\sin\theta = BD/2 \Rightarrow BD = 4/\sqrt{5}$

Length of chord of contact = $AB = 8/\sqrt{5}$