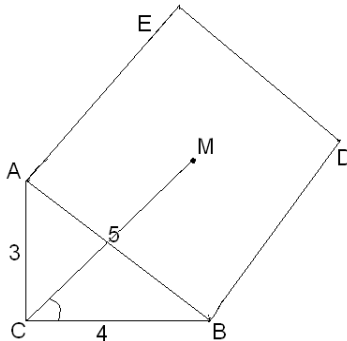


## Huddle 2011

1. In the diagram,  $AC = 3$ ,  $BC = 4$ ,  $AB = 5$ , and  $ABDE$  is a square whose center is  $M$ . Find the measure of  $\angle MCB$  in degrees.



2. If you write out the numbers  $2^{2011}$  and  $5^{2011}$  in the usual decimal notation, how many total digits will you write?

3. Evaluate  $\cos^2(10^\circ) + \cos^2(20^\circ) + \dots + \cos^2(90^\circ)$ .

4. In the diagram,  $ABCD$  is a square in the  $(x, y)$ -plane with side  $AB$  horizontal and side  $BC$  vertical. Points  $E, F$  trisect side  $AB$  and points  $G, H$  trisect side  $BC$ . Points  $K, L$  trisect  $FG$  and points  $M, N$  trisect  $GH$ . What is the slope of the line on points  $L$  and  $M$ ?

