

Example: **Question:** In a right triangle MNO, $\angle N$ is 90° , NO is 4 units long and MO is 5 units long. Triangle PQR is similar to triangle MNO. The vertices P, Q & R correspond to M, N & O respectively. Each side of PQR is two times as long as the sides in triangle MNO. Find the value of $\cos QPR$?

- A) 4
- B) -4
- C) 16
- D) -16

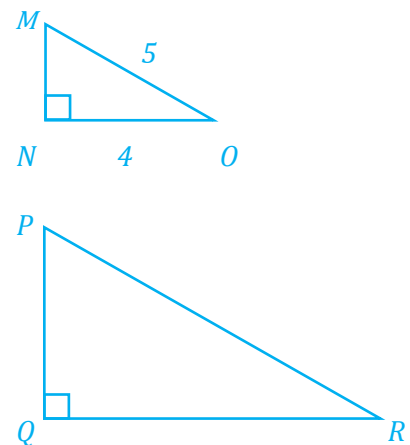
For speed, while solving something similar, only THINK the words in blue; WRITE only the words in other COLORS.

- Given: 1) A right triangle MNO, in which $\angle N$ is 90° , NO is 4 units long and MO is 5 units long
 2) Triangle PQR is similar to MNO.
 3) The vertices P, Q & R correspond to M, N & O respectively.
 4) Each side of PQR is two times as long as the sides in triangle MNO.

Solve: Find the value of $\cos QPR$?

Road Map of Solution:

- First Step: Draw a rough sketch of the two triangles, MNO & PQR.
 Second Step: Find MN using Pythagorean theorem.
 Third Step: Since the triangles are similar, i.e. $\cos QPR = \cos NMO$
 Fourth Step: Solve.



Based on Pythagorean theorem, in triangle MNO,

$$\begin{aligned}
 MO^2 &= MN^2 + NO^2 \\
 5^2 &= MN^2 + 4^2 \\
 25 &= MN^2 + 16 \\
 25 - 16 &= MN^2 + 16 - 16 \\
 9 &= MN^2 \\
 3^2 &= MN^2 \\
 3 &= MN
 \end{aligned}$$

Since the triangles MNO & PQR are similar, the ratios of their sides will also be similar.
 Therefore,

$$\cos QPR = \cos NMO = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{MN}{MO} = \frac{3}{5} \dots\dots\dots \text{Answer.}$$