

**01** A toy of height 9 cm is placed at a distance of 6 cm from the optic centre of a convex lens. A real image of the toy is formed at a distance of 10 cm from the optic centre on the other side of the lens. What is the height of the image ?

Your solution here:

**02** If  $ABC$  is a right triangle with right angle at  $B$ ;  $AC = 2$  units,  $BC = 1$  unit and  $BD$  is perpendicular to  $AC$ . What is the area of the rectangle with  $BD$  as one of its diagonal?

Your solution here:

**03**

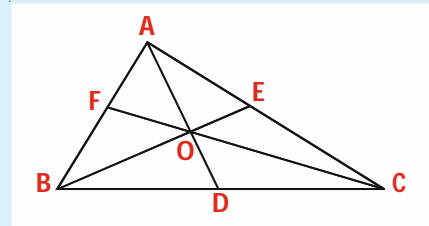
How many triplets  $(x, y, z)$  of positive real numbers can be found such that  $x^y = z$ ,  $y^z = x$  and  $z^x = y$  ?

Your solution here:

**04**

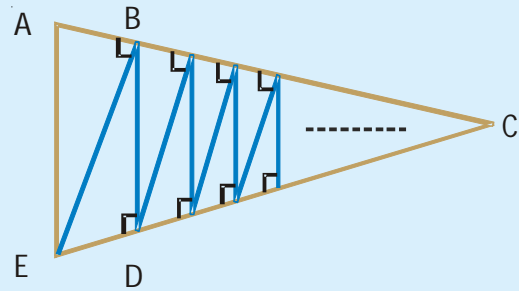
ABC is a triangle and 'O' is the point of intersection of the medians. Prove that  $AB^2 + BC^2 + CA^2 = 3(OA^2 + OB^2 + OC^2)$ .

Your solution here:



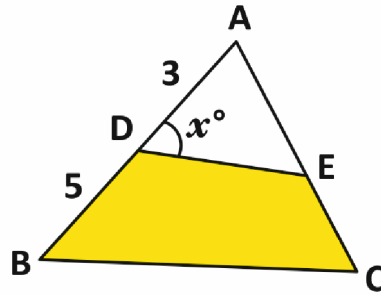
**05** In the given figure, an infinite series of similar right triangles converges to point C. If  $AE = 16$ , and  $ED = 8$ . What is the sum of all the vertical segment ( $AE + BD + \dots$ ) ?

Your solution here:



**06**

In the given figure, find the value of AE if AC = 5.6 cm.



Your solution here:

**07** In the given figure, from a point O, OD, OE, OF are drawn perpendicular to the sides BC, CA and AB respectively of a  $\triangle ABC$ , prove that  $BD^2 - DC^2 + CE^2 - EA^2 + AF^2 - FB^2 = 0$ .

Your solution here:

