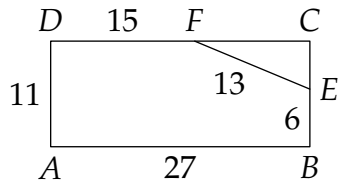




Try these problems before watching the lesson.

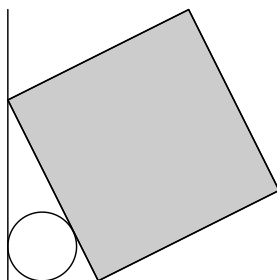
1. In $\triangle XYZ$, we have $\angle X = 30^\circ$, $\angle Y = 90^\circ$, and $YZ = 6$. Find XY and XZ .
2. A triangular corner region is sliced off from a rectangular region as shown below. What is the area of the pentagonal region $ABEFD$ that remains?



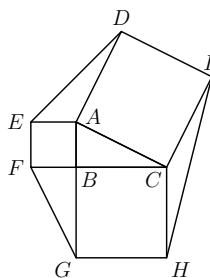
3. Point A is on circle \mathcal{C} and point P is outside the circle such that $AP = 12$ and \overline{AP} is tangent to the circle. If the circle has area 256π square units, then how far is P from the center of the circle?
4. A circle is tangent to all three sides of $\triangle ABC$. The circle meets \overline{AB} at point F and \overline{AC} at point E . If $AB = 14$, $AC = 15$, and $AE = 6$, then what is the length of \overline{BC} ?

 *The Problems*

First Problem: Chloe finds a coin, as shown, wedged tightly into the corner of her drawer behind a rectangular box with a 2.5-inch edge. One corner of the box is 1.5 inches from the corner of the drawer and the other corner of the box is 2 inches from the corner of the drawer. What is the diameter of the coin?

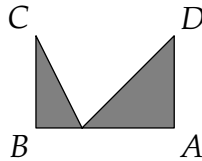


Second Problem: The figure shows right triangle ABC with side lengths 5, 12 and 13. Squares are drawn on each side, and segments DE , FG and HI are drawn between vertices of the squares as shown. What is the area of hexagon $DEFGHI$?

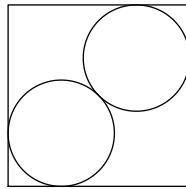


 Follow-up Problems

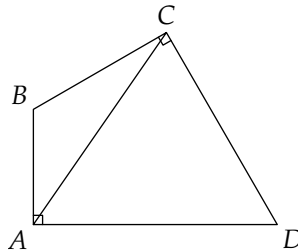
5. In the figure below, $AB = 12$ cm and $BC = AD = 8$ cm. We also have $\overline{BC} \perp \overline{AB}$ and $\overline{DA} \perp \overline{AB}$. How many square centimeters are shaded?



6. In the diagram below, two congruent circles are tangent to each other, and each circle is tangent to two sides of the square. If the side length of the square is 4 units, then what is the radius of each circle? Express your answer in simplest radical form.



7. Two circles with radii 16 and 9 are tangent to each other, and are tangent to line ℓ at distinct points P and Q . Find the length of \overline{PQ} .
8. In triangle ABC , $m\angle ABC = 120^\circ$, $AB = 3$ and $BC = 4$. If lines perpendicular to \overline{AB} at point A and to \overline{BC} at point C meet at point D , then find CD . (Source: AMC 12)



 Share Your Thoughts

Have some thoughts about the video? Want to discuss the problems on the Activity Sheet? Visit the MATHCOUNTS Facebook page or the Art of Problem Solving Online Community (www.artofproblemsolving.com).

