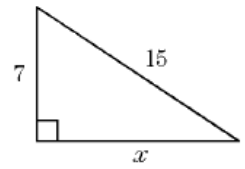
Name:_____ Date:_____

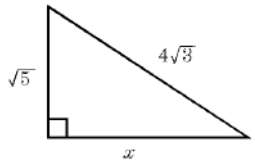
Math 8 Honors: Section 4.2 Applications and Problems with the Pythagorean Theorem: $a^2 + b^2 = c^2$

1. Solve for "x" in each of the following diagrams:

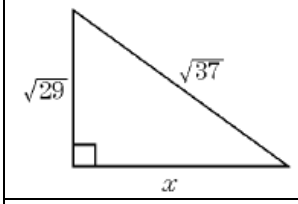
i)



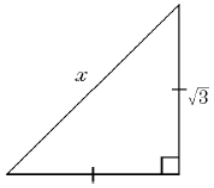
ii)



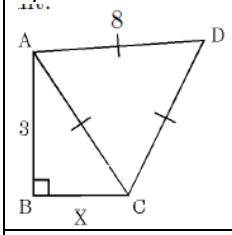
iii)



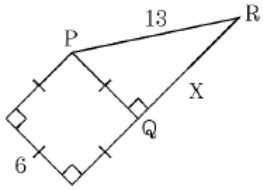
iv)



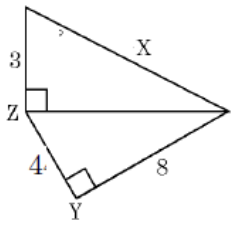
v)



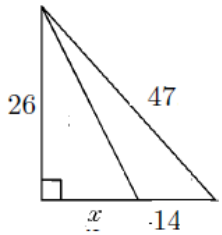
vi)

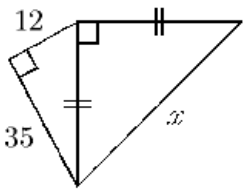


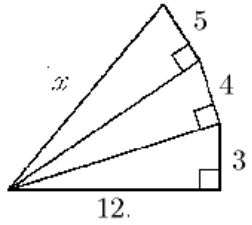
vii)



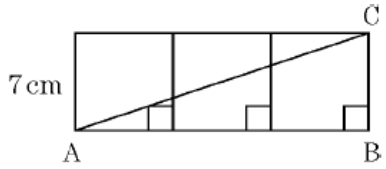
viii)



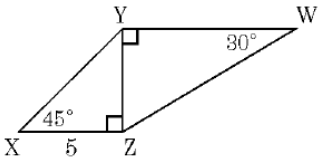




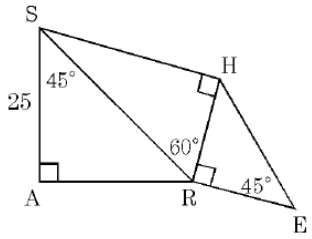
2. Given the diagram below, if the length of each square is 7cm long, what is the length of AC?



3. Given the diagram below, find the length of sides YW and ZW:

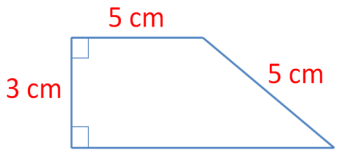


4. Given the diagram below, find the length of HE.

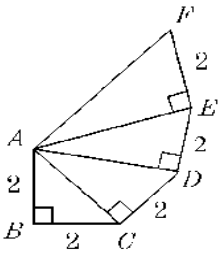


5. What is the number of square units in the area of a triangle whose sides measure 5, 5, and 6 units?

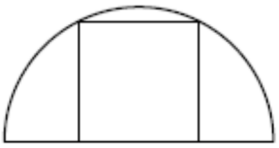
6. What is the area of the trapezoid?



7. Find the length of AF . Write your answer as a mixed radical.



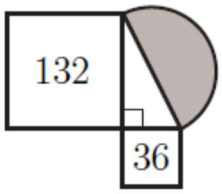
8. What is the area of the square inscribed in a semicircle of radius $3\sqrt{2}$? Express your answer as a fraction.



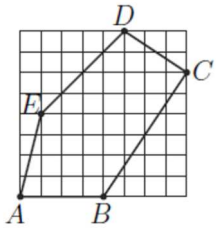
9. Two vehicles leave the same town at 8am. One travels north at 30mph, the othre travels west at 45mph. To the nearest hundredth of a mile, , how far apart are they at 11am the same day?

10. A ship leaves port at 8am travelling due south at 12km/hr. At 3pm the ship changes course and travels due east at 10km/hr. About how far is the ship from its starting point at 8am the next morning?

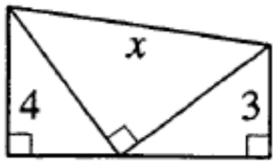
11. Square are erected on the two legs of a right-angled triangle. These squares have areas 36 and 132 as shown. A semicircle (shaded) is drawn with the hypotenuse as diameter. What is the area of the semicircle? Give your answer in terms of π?



12. Each small square in the diagram below has area 1unit2. The diagram consists of 64 squares. What is the area enclosed by the 5 sided figure ABCDE? The points A, B, C, D, and E are all grid points.

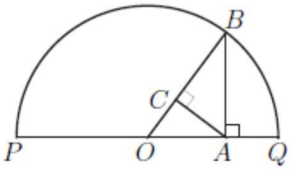


13. The trapezoid has been split into three right triangles, two of which are congruent. If the trapezoid's bases have lengths 3 and 4, how long is the trapezoid's longer leg "x".

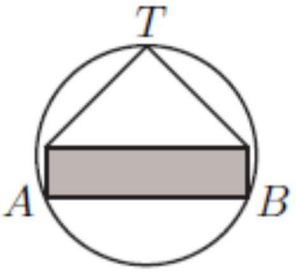


14. The egdges of a rectangular prism are 8, 10, and 12cm. What is the distance from one corner of the rectangular prism to the opposite corner?

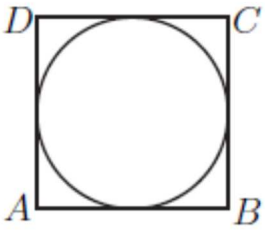
15. The figure below is a half-circle with center O. Given that PA=13 and QA =3, what is the length of OC? Express your answer as a common fraction.



16. The shaded rectangle below has base AB of length 4 and height 1. An isoscele triangle is erected with base the side opposite to AB. The triangle is right-angled at T. A circle is drawn passing through A, B, and T. What is the radius of the circle? Express your answer as a common fraction.

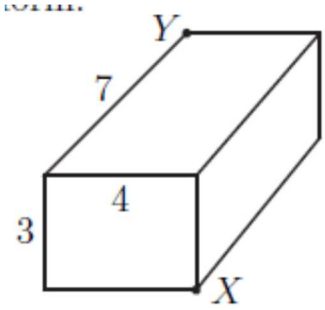


17. In the diagram below, a circle of radius greater than 9cm is inscribed in the square ABCD. A point P on the circle is 8cm from side AB of the square, and 9cm from side AD. What is the radius of the circle?

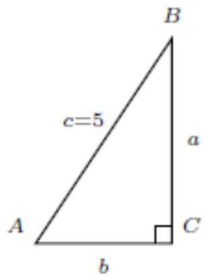


18. A triangle has vertices A(0,0), B(13,0), and C(5,7). The triangle is inscribed in a circle. What are the coordinates of the center of the circle? Express your answer in the form of (x,y) where "X' and "y" are common fractions

19. The diagram below shows a 3 X 4 X 7 rectangular box. What is the length of the shortest path on the surface of the box from point "X" to point "Y". Give your answer as a mixed radical.



12. In the diagram $\triangle ABC$ is a right triangle with the right angle at C, $a+b=\sqrt{45}$, and $c=5$. The area of triangle ABC is:



(A) $3\sqrt{5}$ (B) 6 (C) $4\sqrt{5}$

(D) 5 (E) $\frac{7\sqrt{5}}{2}$