

Note: Figure not drawn to scale.

In the figure, $AC = CD$. The measure of angle EBC is 45° , and the measure of angle ACD is 104° . What is the value of x ?

Square A has side lengths that are **166** times the side lengths of square B. The area of square A is **k** times the area of square B. What is the value of **k** ?

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A cube has an edge length of **68** inches. A solid sphere with a radius of **34** inches is inside the cube, such that the sphere touches the center of each face of the cube. To the nearest cubic inch, what is the volume of the space in the cube not taken up by the sphere?

- A. **149,796**
- B. **164,500**
- C. **190,955**
- D. **310,800**

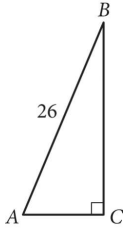
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In triangle ABC , the measure of angle B is 90° and \overline{BD} is an altitude of the triangle. The length of \overline{AB} is 15 and the length of \overline{AC} is 23 greater than the length of \overline{AB} . What is the value of $\frac{BC}{BD}$?

- A. $\frac{15}{38}$
- B. $\frac{15}{23}$
- C. $\frac{23}{15}$
- D. $\frac{38}{15}$

In triangles ABC and DEF , angles B and E each have measure 27° and angles C and F each have measure 41° . Which additional piece of information is sufficient to determine whether triangle ABC is congruent to triangle DEF ?

- A. The measure of angle A
- B. The length of side AB
- C. The lengths of sides BC and EF
- D. No additional information is necessary.



Triangle **ABC** above is a right triangle, and $\sin(B) = \frac{5}{13}$.

What is the length of side \overline{BC} ?

In triangles LMN and RST , angles L and R each have measure 60° , $LN = 10$, and $RT = 30$. Which additional piece of information is sufficient to prove that triangle LMN is similar to triangle RST ?

- A. $MN = 7$ and $ST = 7$
- B. $MN = 7$ and $ST = 21$
- C. The measures of angles M and S are 70° and 60° , respectively.
- D. The measures of angles M and T are 70° and 50° , respectively.

The graph of $x^2 + x + y^2 + y = \frac{199}{2}$ in the xy -plane is a circle. What is the length of the circle's radius?

Circle A in the xy -plane has the equation $(x + 5)^2 + (y - 5)^2 = 4$. Circle B has the same center as circle A. The radius of circle B is two times the radius of circle A. The equation defining circle B in the xy -plane is $(x + 5)^2 + (y - 5)^2 = k$, where k is a constant. What is the value of k ?

A cube has a volume of **474,552** cubic units. What is the surface area, in square units, of the cube?

The perimeter of an equilateral triangle is **624** centimeters. The height of this triangle is $k\sqrt{3}$ centimeters, where k is a constant. What is the value of k ?