

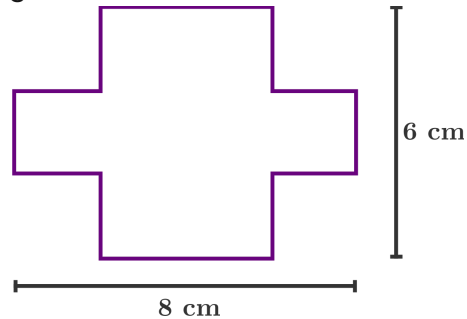
## Competitive Math Assessment - Measures Practice Quiz #2

Here are some suggestions for how to practice replicating testing conditions:

- Make sure you have a quiet place to practice on your own for an extended period of time. This will help model the actual experience of a competition. When you have finished the quiz, check your solutions using the online Brilliant quiz.
- Set a timer, or at least keep an eye on the clock to learn your own pace. If you want to set a specific time goal, math competitions provide an average of about 2 minutes per problem, so you should give yourself 30-40 minutes to complete these problems. Keep in mind that the general difficulty of problems increases as you move forward.
- Some competitions allow students to use calculators while others do not. We encourage you to use a calculator only for the most in-depth calculations on this practice quiz.

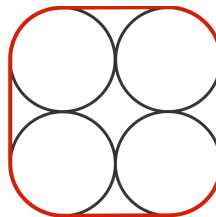
1. \_\_\_\_\_

A 6 cm by 8 cm piece of paper has a 2 cm by 2 cm square removed from each corner. What is the perimeter, in cm, of the resulting figure?



2. \_\_\_\_\_

A belt is wrapped around four congruent circles, each with an area of  $4\pi$ . What is the length of the belt?



**A.**  $8 + 4\pi$

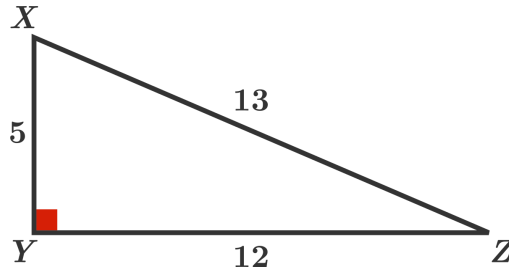
**B.**  $8 + 8\pi$

**C.**  $16 + 4\pi$

**D.**  $16 + 8\pi$

3. \_\_\_\_\_

Point  $A$  is added on  $XZ$  so that the perimeter of triangle  $XYA$  is the same as the perimeter of triangle  $YAZ$ . What is the ratio of  $XA : AZ$ ?



A. 12 : 5

B. 3 : 1

C. 10 : 3

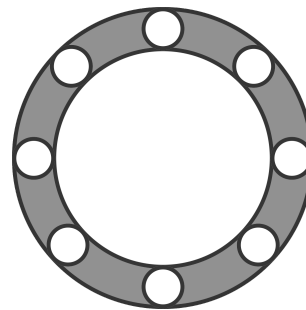
D. 7 : 6

4. \_\_\_\_\_

A polygon with  $n$  sides has one exterior angle of  $72^\circ$  and another of  $35^\circ$ . The remaining exterior angles all measure  $23^\circ$ . What is  $n$ ?

5. \_\_\_\_\_

The eight small congruent circles are tangent to the large inner circle and tangent to the larger outer circle. The radius of the entire figure is 8 and the radius of the large white circle is six times greater than the radius of each small white circle. What is the shaded area of the figure?



A.  $7\pi$

B.  $16\pi$

C.  $20\pi$

D.  $24\pi$

6. \_\_\_\_\_

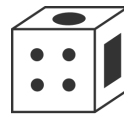
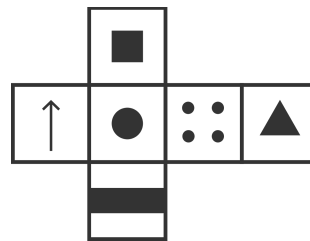
The sum of the interior angles of a polygon doesn't exceed  $3600^\circ$ . What is the maximum possible number of sides of the polygon?

7. \_\_\_\_\_

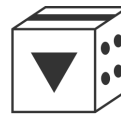
A rectangle with a perimeter of 42 has a diagonal length of 15. What is the area of the rectangle?

8. \_\_\_\_\_

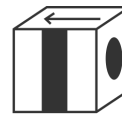
Which cube cannot be made from the unfolded cube?



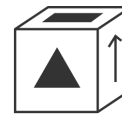
A



B



C



D

A. Cube A

B. Cube B

C. Cube C

D. Cube D

9. \_\_\_\_\_

A cube with 3 cm edges is made from 27 cubes with 1 cm edges. 23 of the cubes are green and 4 are blue. If all 4 blue cubes are used on corners of the new larger cube, what fraction of the surface area of the new cube is blue?

A.  $\frac{1}{9}$

B.  $\frac{1}{3}$

C.  $\frac{2}{9}$

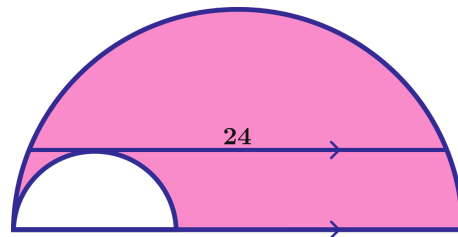
D.  $\frac{4}{23}$

10. \_\_\_\_\_

In a triangle with integer side lengths, one side is twice as long as another side, and the length of the third side is 12. What is the greatest possible perimeter of the triangle?

11. \_\_\_\_\_

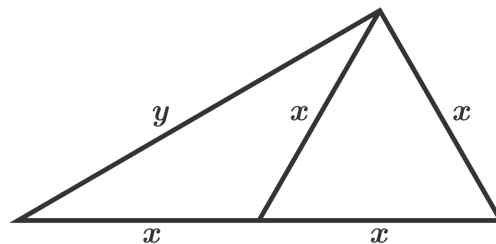
Given that the chord of the semicircle with length 24 is parallel to its diameter, what is the pink area in square units?



- A.  $36\pi$
- B.  $40\pi$
- C.  $48\pi$
- D.  $56\pi$
- E.  $72\pi$

12. \_\_\_\_\_

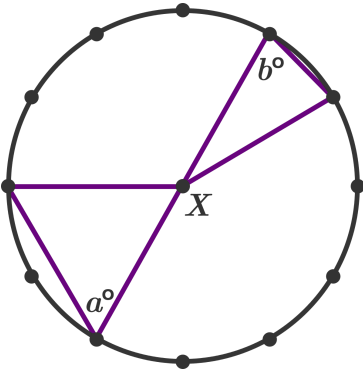
What is the ratio of  $y$  to  $x$ ?



- A.  $\sqrt{2}$
- B.  $\frac{3}{2}$
- C.  $\sqrt{3}$
- D. 2

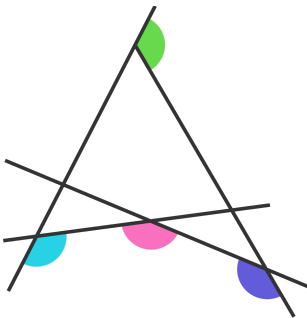
13. \_\_\_\_\_

The circumference of circle  $X$  is divided into 12 equal lengths. What is  $a + b$ ?



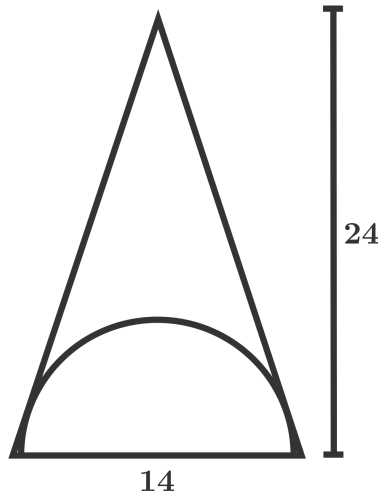
14. \_\_\_\_\_

What is the sum, in degrees, of the measures of the colored angles?



15. \_\_\_\_\_

A semicircle is inscribed in an isosceles triangle such that its diameter lies on the base of the triangle. If the triangle has a base length of 14 and a height of 24, what is the radius of the semicircle?



A.  $\frac{168}{25}$

B. 7

C.  $\frac{25\sqrt{2}}{2}$

D.  $\frac{25\sqrt{3}}{2}$