# BRILLIANT

Competitive Math Assessment - Composites 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.

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1. _____

In the regular hexagon below, the area of the region shaded red is 5. What is the area of the region shaded blue?
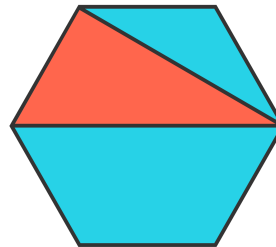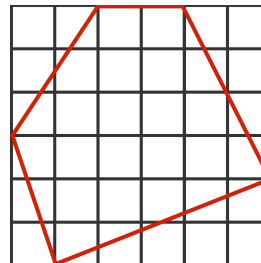

A. $\frac{15}{2}$

B. 10

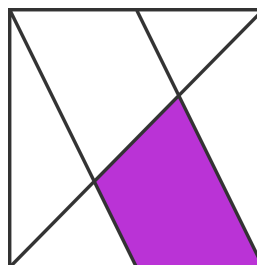**C.** 12

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

2. _____

If each grid square has an area of 1, what is the area of the pentagon?

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3. _____

The figure below is a square in which vertices are connected with other vertices or midpoints of opposite sides. If the area of the square is 12, what is the area of the purple region?
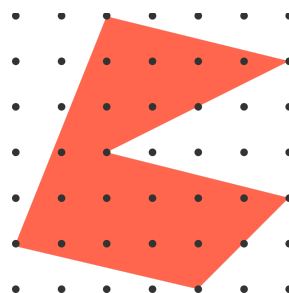

A. 3

B. $\frac{7}{2}$
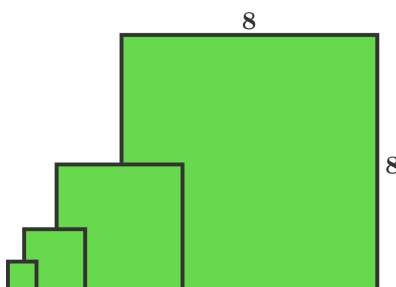
C. $\frac{9}{2}$

D. 4

4. _____

If the vertical and horizontal distance between grid dots is 1, what is the area of red polygon?

5. _____

The figure below is created by overlapping squares such that each square is bisected by the side of another square, and each square's side length is twice as large as the side length of the square to the left of it. What is the area of the figure?

8

8

6. _____

In the figure below, a circle is inscribed in a regular hexagon. If the area of the circle is what is the perimeter of the hexagon?
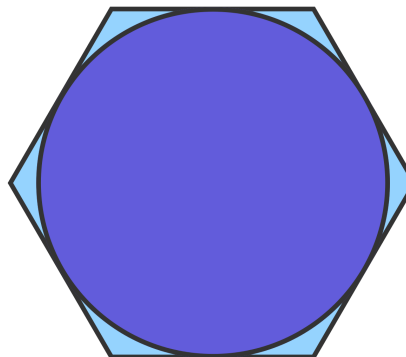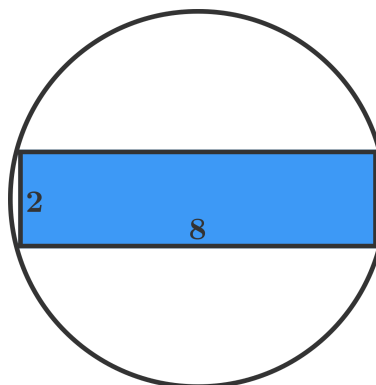
A. $3\sqrt{3}$ **B.** $4\sqrt{3}$

C. $6\sqrt{3}$ **D.** $8\sqrt{3}$

7. _____

The rectangle inscribed in the circle has a length of 8 and a height of 2. What is the area of the circle?
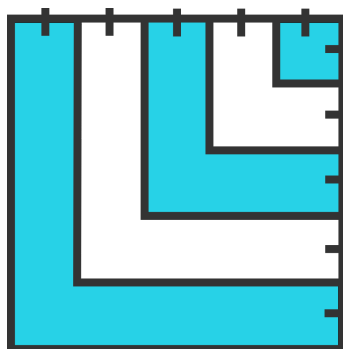
A. 15π **B.** 16π

C. 17π **D.** 20π

8. _____

The figure below is made from a set of overlapping squares. What is the ratio of the blue area to the white area?
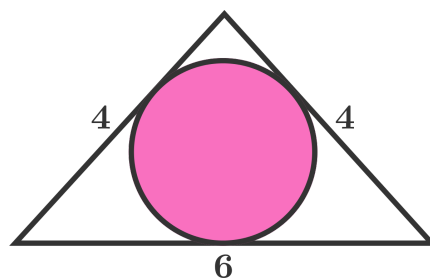

A. $3 : 2$ **B.** $4 : 3$

C. $13 : 10$ **D.** $5 : 4$

9. _____

What is the area of the pink circle?
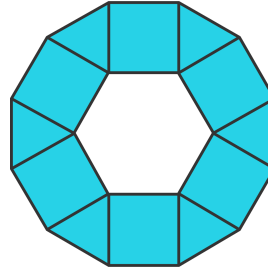

A. $\frac{9}{7}\pi$ **B.** $\frac{9\sqrt{7}}{7}\pi$

C. $\frac{4}{9}\pi$ **D.** $\frac{7}{9}\pi$

10. _____

The figure below is created by adding squares and equilateral triangles around the outside of a regular hexagon. If the regular hexagon in the middle has an area of 12, what is the area of the blue ring?
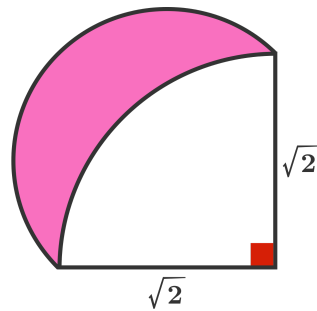
A. $6 + 18\sqrt{3}$ **B.** $16 + 12\sqrt{3}$

C. $12 + 8\sqrt{3}$ **D.** $12 + 16\sqrt{3}$

11. _____

What is the area of the pink lune?

$\sqrt{2}$

$\sqrt{2}$

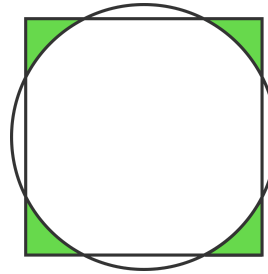**A.** 1 **B.** $\frac{3}{4}\pi$

C. 2 **D.** $\frac{1}{2}\pi$

12. _____

Each side of the square below contains a chord that has the same length as the radius of the circle. If the radius of the circle is 2, what is the total area of the regions shaded green?
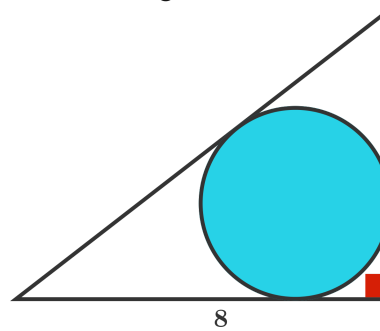

A. $12 - 2\sqrt{3} - \frac{4}{3}\pi$

B. $6 - 4\sqrt{3} - \frac{4}{3}\pi$

C. $12 - 4\sqrt{3} - \frac{4}{3}\pi$

D. $12 - 2\sqrt{3} - \frac{2}{3}\pi$
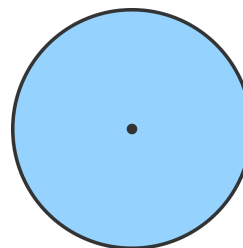
13. _____

The area of the circle inscribed in the triangle below is 4π. What is the area of the triangle?

8

14. _____

A dart thrown at a circular dartboard has an equally likely chance of landing anywhere on the dartboard. What is the probability that it lands closer to the center than to the edge?
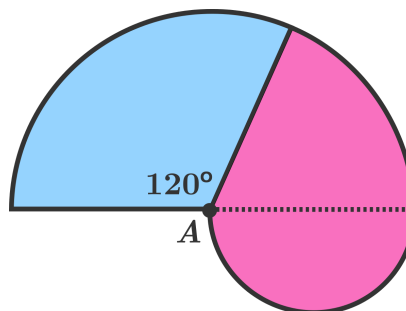

A. $\frac{1}{8}$

B. $\frac{1}{4}$

C. $\frac{3}{8}$

D. $\frac{1}{2}$

15. _____

Given that point A is the center of the larger semicircle in the figure below, what is the ratio of the blue area to the pink area?

A. $7 : 8$ **B.** $6 : 7$

C. $7 : 6$ **D.** $8 : 7$