



BRILLIANT

Competitive Math Assessment - Similarity 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. _____ Square $ABCD$ has vertices $A = (-7, 2)$, $B = (3, 8)$, $C = (9, -2)$ and $D = (x, y)$. What is xy ?

- A. -12 B. -10
C. 8 D. 10

2. _____ The areas of three faces of a rectangular box are 8 ft^2 , 10 ft^2 , and 20 ft^2 . What is the volume of the box, in cubic feet?

3. _____ A cylinder has a radius of 12 and a height of 6. Which cylinder will have twice as much volume?

- A. Cylinder A: radius of 24 and a height of 6
B. Cylinder B: radius of 12 and a height of 12
C. Cylinder C: radius of 6 and a height of 12
D. Cylinder D: radius of 24 and a height of 12

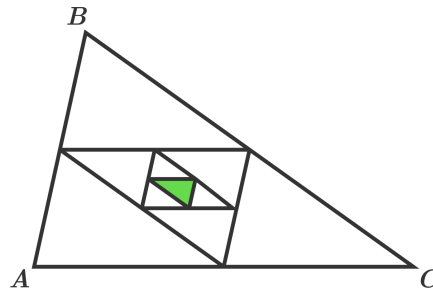
4. _____

If the length of a rectangle is increased by 20% and its width is increased by 40%, then the area is increased by what percent?

- A. 48%
- B. 60%
- C. 68%
- D. 80%

5. _____

A series of smaller triangles are created by connecting midpoints of the sides of the larger triangles. If the area of triangle ABC is 64, what is the area of the shaded green triangle?



- A. $\frac{1}{8}$
- B. $\frac{1}{4}$
- C. $\frac{1}{2}$
- D. 1

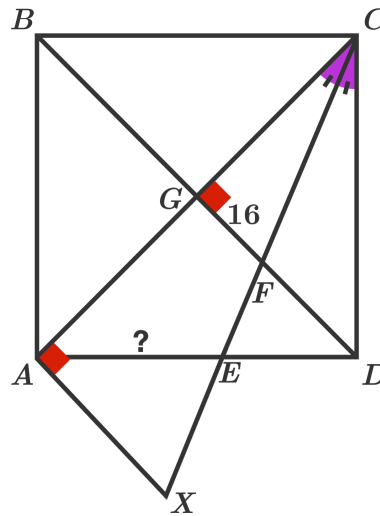
6. _____

Every side of the base of a square pyramid is decreased by 10%. What is the closest percent by which the height must increase so that the volume of the new pyramid is the same as the volume of the original pyramid?

- A. 10
- B. 18
- C. 20
- D. 23

7. _____

In square $ABCD$, $GF = 16$. What is AE ?



A. 20

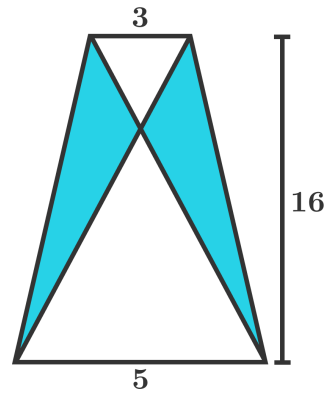
B. 24

C. 28

D. 32

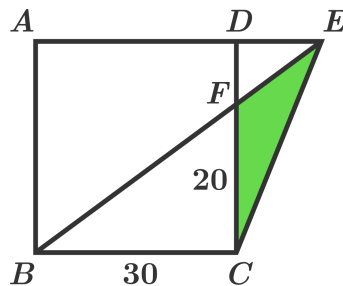
8. _____

What is the total area of the regions shaded blue in the isosceles trapezoid below?



9. _____

In square $ABCD$, $BC = 30$ and $CF = 20$. What is the area of triangle CEF ?



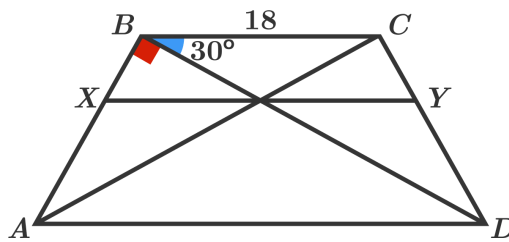
10. _____

If x and y are integers and $(x-5)^2 + (y+12)^2 = 169$, what is the greatest possible value of $x^2 + y^2$?

- A. 338
- B. 576
- C. 586
- D. 676

11. _____

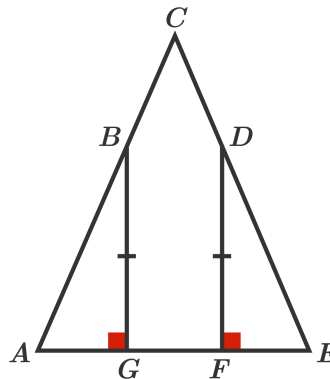
In isosceles trapezoid $ABCD$, what is the ratio of $BC : XY$?



- A. 1 : 2
- B. 2 : 3
- C. 3 : 4
- D. 4 : 5

12. _____

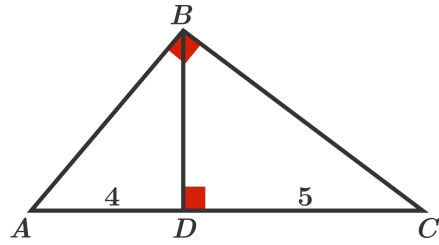
Isosceles triangle ACE has a base length of 8 and a height of 10. In addition, $AB = 0.6AC$. What is the area of pentagon $BCDFG$?



- A. $\frac{72}{5}$
- B. 20
- C. $\frac{116}{5}$
- D. $\frac{128}{5}$

13. _____

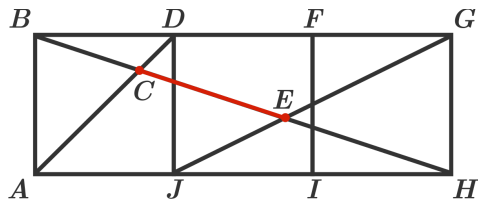
What is the area of triangle ABC ?



- A. 20
 B. $9\sqrt{5}$
 C. $10\sqrt{5}$
 D. 27

14. _____

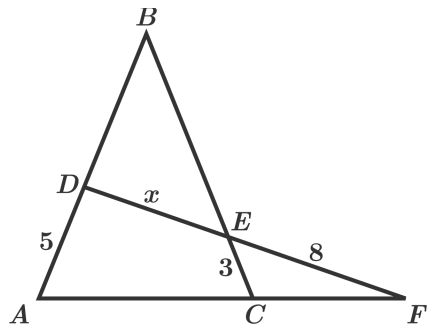
Given the three adjacent squares, what is $CE : BH$?



- A. $\frac{1}{3}$
 B. $\frac{7}{20}$
 C. $\frac{3}{7}$
 D. $\frac{3}{5}$

15. _____

In isosceles triangle ABC , $AB = BC$, $AD = 5$, $EC = 3$, and $EF = 8$. What is x ?



- A. $\frac{13}{3}$
 B. $\frac{16}{3}$
 C. $\frac{17}{3}$
 D. $\frac{19}{3}$