

Grade 7 · Cross Sections of 3D Figures · Quiz

Common Core 7.G.A.3 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

Take this ten-question multiple-choice quiz to practice cross sections from Common Core standard 7.G.A.3. Each question has exactly one correct answer. The explanation after each question names the shape or area calculation and points out the most common mistake.

Grade 7 Common Core: 7.G.A.3

Questions

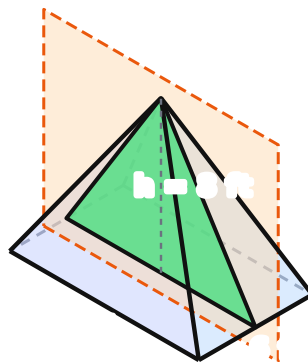
Question 1

A rectangular prism is sliced by a plane parallel to its base. What is the cross section?

- A. A rectangle the same size as the base
- B. A rectangle smaller than the base
- C. A triangle
- D. A trapezoid

Question 2

A plane perpendicular to the base passes through the apex of this rectangular pyramid. What is the cross section?

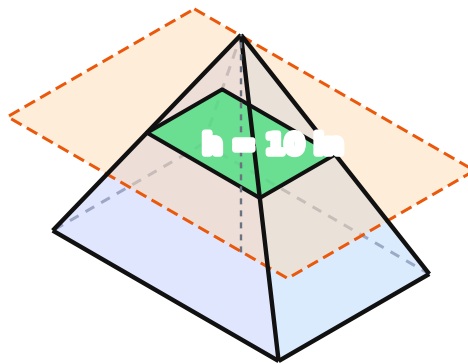


Vertical slice through the apex.

- A. Rectangle
- B. Trapezoid
- C. Triangle
- D. Square

Question 3

The plane is parallel to the base and halfway up the pyramid. What are the dimensions of the cross section?

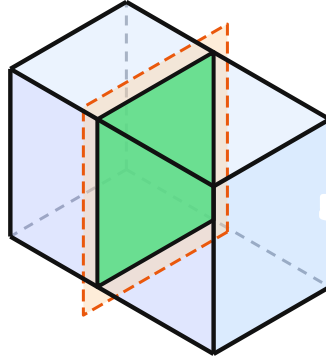


Slice halfway up the pyramid.

- A. 12 in. by 8 in.
- B. 6 in. by 4 in.
- C. 6 in. by 8 in.
- D. 12 in. by 4 in.

Question 4

The plane is perpendicular to the base and parallel to the 4 cm by 5 cm end. What is the area of the cross section?



Vertical slice parallel to an end.

- A. 20 cm^2
- B. 28 cm^2
- C. 35 cm^2
- D. 140 cm^2

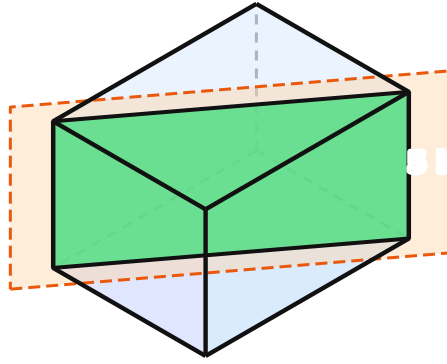
Question 5

A plane is perpendicular to the base of a rectangular pyramid and parallel to one base edge. It does not pass through the apex. What is the cross section?

- A. Triangle
- B. Rectangle
- C. Pentagon
- D. Trapezoid

Question 6

The plane cuts across the base diagonal, which is 10 in. long. The prism is 5 in. tall. What is the area of the cross section?

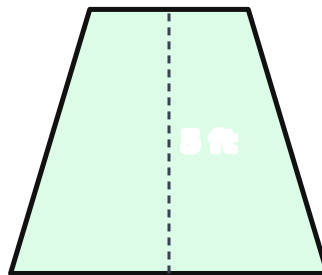


Vertical slice across the diagonal.

- A. 30 in.^2
- B. 40 in.^2
- C. 50 in.^2
- D. 48 in.^2

Question 7

The cross section of a pyramid is the trapezoid shown. What is its area?



Trapezoid cross section.

- A. 45 ft^2
- B. 22.5 ft^2
- C. 30 ft^2
- D. 15 ft^2

Question 8

A pyramid has a 9 cm by 6 cm base and a height of 12 cm. A plane parallel to the base cuts it 4 cm above the base. What is the area of the cross section?

- A. 24 cm^2
- B. 54 cm^2
- C. 36 cm^2
- D. 18 cm^2

Question 9

Which plane cuts a cube so that the cross section is a square?

- A. Only a plane parallel to the base
- B. A plane perpendicular to the base through opposite bottom corners
- C. Any plane parallel to a face of the cube
- D. No plane can give a square

Question 10

Noah slices a loaf shaped like a rectangular prism that is 15 in. long. Each cut is perpendicular to the length, and each slice is $\frac{1}{2}$ in. thick. How many slices does he get?

- A. 7.5
- B. 15
- C. 60
- D. 30

Answer key

1. **A** – Every slice parallel to the base of a prism is a copy of the base. A pyramid, not a prism, gives smaller slices.
2. **C** – The plane meets the base in a segment and the two slanted faces in two segments that meet at the apex, so the slice is a triangle.
3. **B** – Halfway up, every side is half as long: $12 \div 2 = 6$ and $8 \div 2 = 4$. The base size 12 by 8 would be the slice at the very bottom.
4. **A** – The cross section is a 4 cm by 5 cm rectangle, so its area is $4 \times 5 = 20$. The value 140 is the volume of the whole prism.
5. **D** – The slice has parallel top and bottom edges but slanted sides, so it is a trapezoid. A triangle needs the plane to pass through the apex.
6. **C** – The cross section is a rectangle 10 in. by 5 in., so $10 \times 5 = 50$. The values 30, 40, and 48 use 6, 8, or the base area instead of the diagonal.
7. **B** – $A = \frac{1}{2}(6+3) \times 5 = 22.5$. The value 45 forgets the $\frac{1}{2}$, and 30 and 15 use only one of the parallel sides.
8. **A** – The fraction left above the cut is $\frac{12-4}{12} = \frac{2}{3}$, so the sides are 6 cm and 4 cm and the area is 24. The value 54 is the area of the base.
9. **C** – Every plane parallel to a face is a copy of that face, which is a square. A diagonal slice gives a rectangle that is longer than it is wide.
10. **D** – $15 \div \frac{1}{2} = 30$. The value 7.5 multiplies $15 \times \frac{1}{2}$ instead of dividing.

Remember:

- A cross section is the two-dimensional shape where a plane meets a solid.
- Any slice of a right rectangular prism that is parallel or perpendicular to the base is a rectangle.
- A slice of a right rectangular pyramid parallel to the base is a smaller rectangle.
- A slice of a right rectangular pyramid perpendicular to the base is a triangle if it passes through the apex, and a trapezoid if it does not.
- The area of a cross section is found with the usual area formula for its shape.