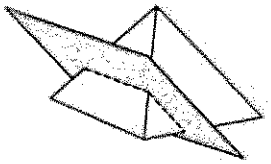
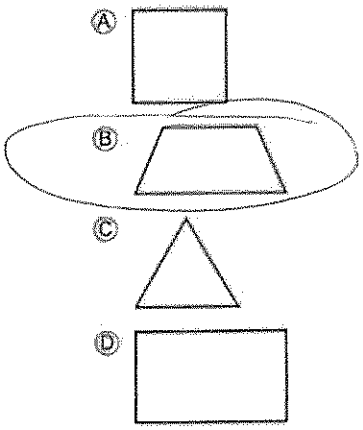
Just as we can cut segments into pieces, we can cut 3-dimensional objects:

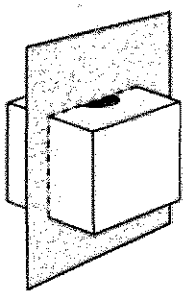
1 A square pyramid is cut along the shaded plane shown below.



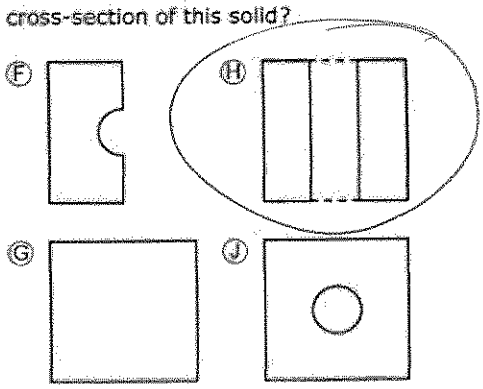
Which of the following is the cross-section of this solid?



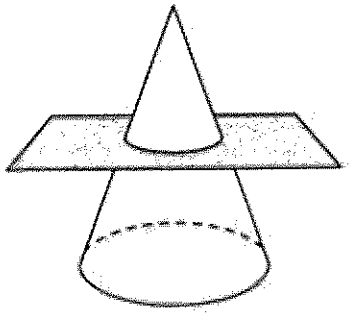
2 A cube with a cylinder cut from its center is cut along the plane shown below.



Which of the following is the cross-section of this solid?



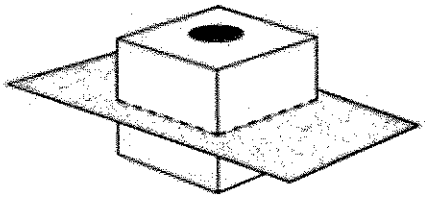
3 A cross-section is cut from the circular cone below.



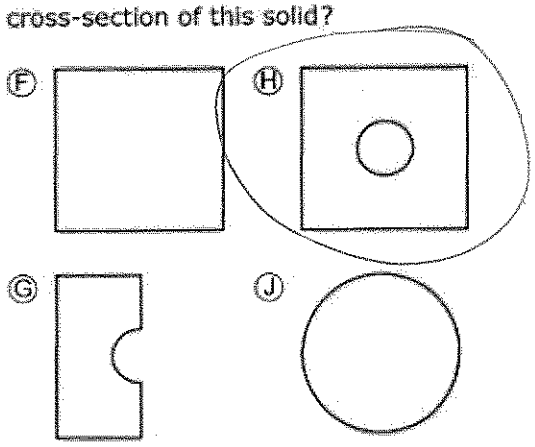
What is the shape of the cross-section?

Ⓐ Square
Ⓑ Semicircle
Ⓒ Triangle
Ⓓ Circle

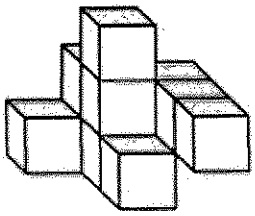
4 A cube with a cylinder cut from its center is cut along the plane shown below.

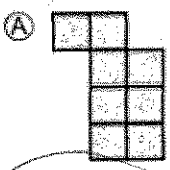


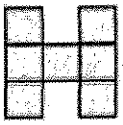
Which of the following is the cross-section of this solid?

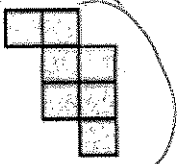


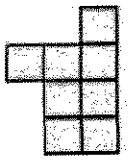
5 Which drawing represents the top view of this solid?



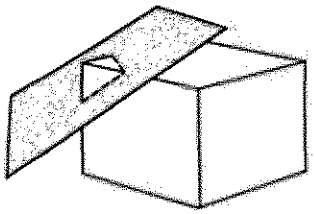
Ⓐ 

Ⓒ 

Ⓑ 

Ⓓ 

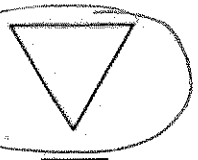
6 A rectangular prism is cut along the shaded plane shown below.



Which of the following is the cross-section of this solid?

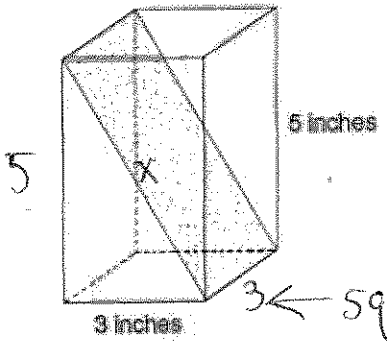
Ⓕ 

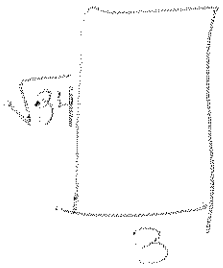
Ⓖ 

Ⓗ 

Ⓙ 

9 Andrew had a piece of foam in the shape of a rectangular prism as shown below. The base is a square with sides 3 inches long, and the piece is 5 inches tall. He cut the foam along the diagonal plane shown by the shaded area.





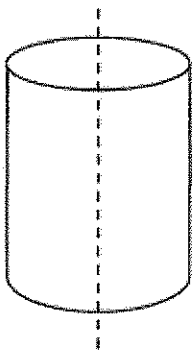
Which of the following is closest to the area of the shaded diagonal plane?

Ⓐ 19.3 square inches
Ⓑ 12 square inches
Ⓒ 15.8 square inches
Ⓓ 17.5 square inches

$5^2+3^2=x^2$
$25+9=x^2$
$\sqrt{34}=x$

$A_{rectangle}=bh$
$=3(\sqrt{34})$

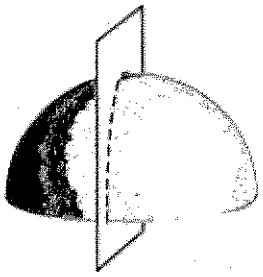
11 A cross-section is cut from the cylinder below.



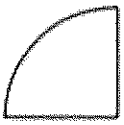
What is the shape of the cross-section?

Ⓐ Rectangle
Ⓑ Circle
Ⓒ Semicircle
Ⓓ Oval

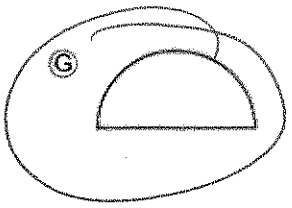
18 A hemisphere is cut along the plane shown below.



Which of the following is the cross-section of this solid?

Ⓕ 

Ⓗ 

Ⓖ 

Ⓙ 

Practice: Segment Addition Postulate and Cross Sections

Points A, B and C are collinear. Point B is between A and C. Solve for x.

1. $AC = 3x + 3$, $AB = -1 + 2x$, and $BC = 11$.
Find x.

$AB + BC = AC$
$-1 + 2x + 11 = 3x + 3$
$2x + 10 = 3x + 3$
$7 = x$

Check
$AB + BC = AC$
$-1 + 2(7) + 11 = 3(7) + 3$
$24 = 24$ ✓

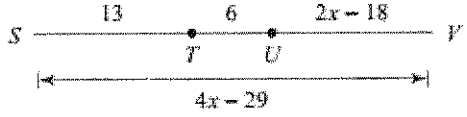
2. $AC = 22$, $BC = x + 14$, and $AB = x + 10$.
Find x.

22
$AB + BC = AC$
$x + 10 + x + 14 = 22$
$2x + 24 = 22$
$2x = -2$
$x = -1$

Check
$AB + BC = AC$
$-1 + 10 + -1 + 14 = 22$
$9 + 13 = 22$ ✓

Solve for x.

3.



$ST + TU + UV = SV$
$13 + 6 + 2x - 18 = 4x - 29$
$2x + 1 = 4x - 29$
$30 = 2x$
$x = 15$

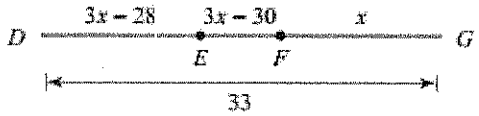
$13 + 6 + 2(15) - 18 = 4(15) - 29$
$25 = 25$

4. Find CE

$BC + CE = BE$ $\quad CE = 14$
and $BD + DE = BE$
$\therefore BC + CE = BD + DE$
$3x + 47 + x + 26 = 27 + x + 10$
$4x + 73 = x + 37$
$x = -12$

* remember variables can be negative but side lengths & angle measures can't!!

5. Find DE



$3x-28+3x-30+x=33$

$7x-58=33$

$7x=91$

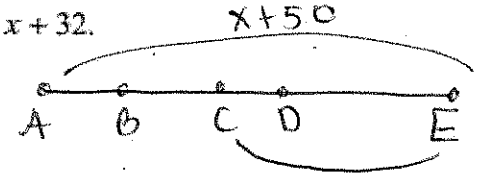
$x=13$

$DE=3(13)-28$

$39-28$

$DE=11$

6. Points A, B, C, D, and E are collinear and in that order. Find AC if $AE = x + 50$ and $CE = x + 32$.



$AC+CE=AE$

$AC+x+32=x+50$

$-x\ -32\quad -x\ -32$

$x=18$

Use the original solid to **describe** the shape of the **cross section**.

7. **Cylinder:** cross section parallel to the base Circle

cross section perpendicular to the base rectangle

diagonal - from corner to corner oval (or ellipse)

8. **Square Pyramid:** cross section parallel to the base square

cross section perpendicular to the base triangle

diagonal - from corner to corner trapezoid