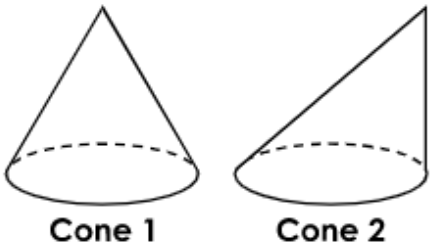
Pear Assessment

Geometry 2017-2024 GMD

Created By Sean

1 Two cones are shown. The heights and bases of Cone 1 and Cone 2 are congruent.



$V_1 = V_2$

In Cone 1, the vertex Is directly above the center of the circle. In Cone 2, the vertex is directly above a point on the circle.

Select the phrases that correctly complete the sentences comparing the cross sections and volumes of Cone 1 and Cone 2.

The area of a cross section parallel to the base at the same height In each cone is

a

Therefore, the volume of Cone 1 is b the volume of Cone 2.

a

- [x] equal for Cone 1 and Cone 2.
- [ ] larger for Cone 1 than for Cone 2.
- [ ] smaller for Cone 1 than for Cone 2.

b

- [x] equal to
- [ ] less than
- [ ] greater than

2 To estimate the area of the circle, Henry divides a circle of radius r into n triangles, as shown, and uses the expression $\frac{h}{2}(b_1 + b_2 + \ldots + b_n)$ to estimate the area of the circle. In the expression, variables b_1, b_2, up to b_n represent the base lengths of each triangle and h represents the height of each triangle.

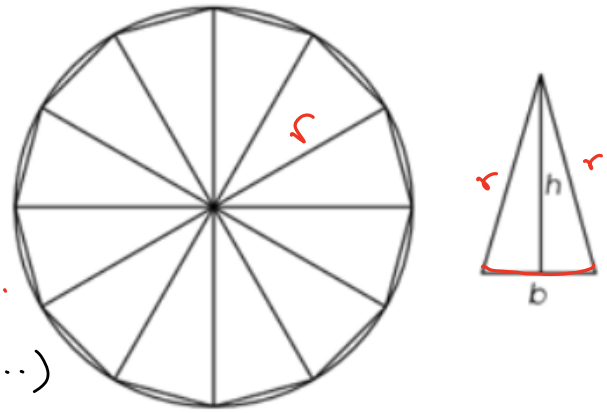
$A_1 = \frac{1}{2} b_1 h$

$A_2 = \frac{1}{2} b_2 h$

$A_3 = \frac{1}{2} b_3 h$

total Area $= \frac{1}{2} b_1 h + \frac{1}{2} b_2 h + \cdots$

$= \frac{1}{2} h (b_1 + b_2 + b_3 + \cdots)$



Henry claims that the more triangles the circle is divided into, the closer the estimated area will be to the actual area.

Which statement about Henry's claim is accurate?

(A) His claim is accurate because as n gets larger, the value of h gets closer to the value of r and the value of $(b_1 + b_2 + \ldots + b_n)$ approaches $2\pi r$.

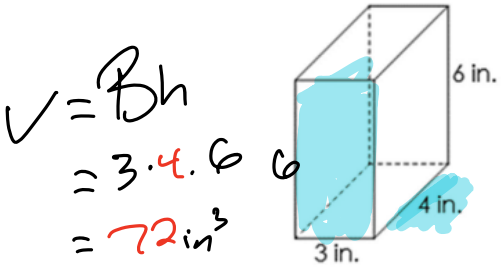
(B) His claim is accurate because as n gets larger, the value of h gets closer to the value of $2r$ and the value of $(b_1 + b_2 + \ldots + b_n)$ approaches πr.

(C) His claim is inaccurate because as n gets larger, the value of h gets closer to the value of r and the value of $(b_1 + b_2 + \ldots + b_n)$ deviates from $2\pi r$.

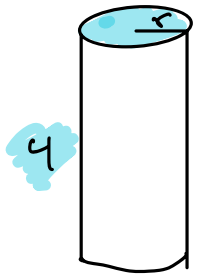
(D) His claim is inaccurate because as n gets larger, the value of h gets closer to the value of $2r$ and the value of $(b_1 + b_2 + \ldots + b_n)$ deviates from πr.

3 The items has two parts.

(a) The figure shows the dimensions, in inches (in.), of a wax candle.



$V = Bh$
$= 3 \cdot 4 \cdot 6$
$= 72 in^3$



$V = B \cdot h$
$72 = \pi r^2 \cdot 4$
$\frac{72}{4\pi} = r^2$
$\sqrt{\frac{72}{4\pi}} = r$

The candle is melted and remolded in the shape of a right cylinder of height 4 inches so that the volume remains the same.

$2.39 \approx r$

Part A

Complete the sentence of relate the dimensions of the two shapes.

As the volume of the two shapes are the same and the height of the cylinder is equal to one of the side lengths of the prism, the **a** of the cylindrical candle must be equal to the **b** of the face of the prism with side lengths that are not equal to the height of the cylinder.

a

- ✓ area of the base
- circumference of the base

b

- ✓ area
- perimeter

(b) **Part B**

The face of the prism with side lengths not equal to the height of the cylinder is 3 inches by 6 inches. The radius, rounded to the nearest hundredth of an inch, of the base of the cylindrical candle is 2.39 inches.

2 decimals

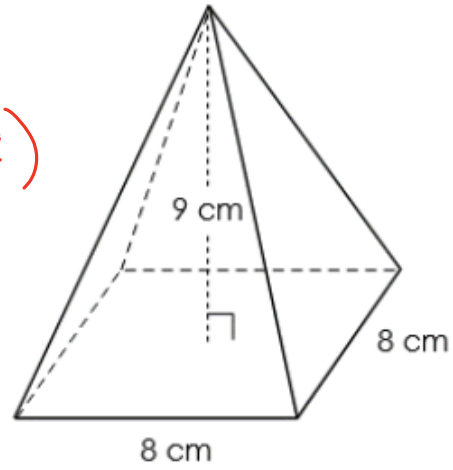
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4 A square pyramid is shown, with dimensions in centimeters (cm).

$V = \frac{1}{3}Bh$

$V = \frac{1}{3}(8)(8)(9)$

$V = 192$



What is the volume, in cubic centimeters, of the pyramid?

192 cubic centimeters

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5 Iris created a pyramid-shaped figurine out of solid aluminum with the dimensions shown.

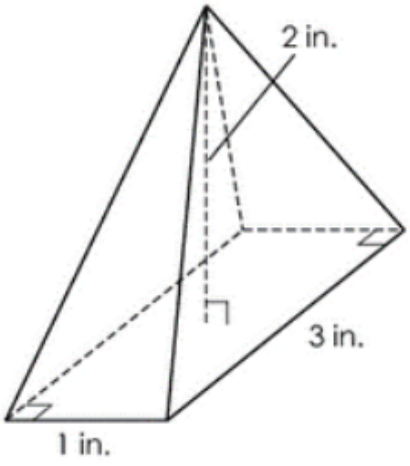
$V = \frac{1}{3}Bh$

$V = \frac{1}{3}(3 \cdot 1)(2)$

$V = 2 \text{ in}^3$

Price = $2 \cdot \$7.50$

Price = $\$15.00$



Iris sells all of her figurines for $7.50 per cubic inch.

What is the price of this figurine?

$ 15

---

6 A cone and a sphere have the same volume. The height of the cone is 96 units.

What could be the values for the radius of the cone and the sphere? Round your answers to the nearest hundredth as needed.

Radius of Cone: 1 ***units***

Radius of Sphere: 2.88 ***units***

Possible Answers

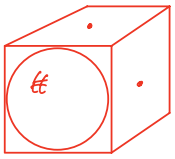
WORK ON NEXT PAGE

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7 A globe has a diameter of 12 inches. It fits inside a cube-shaped box that has a side length of 12 inches.
What is the volume, rounded to the nearest hundredth of a cubic inch, of the space inside the box that is not taken up by the globe?

Round your answer to +2 digits.

823.22 *cubic inches*



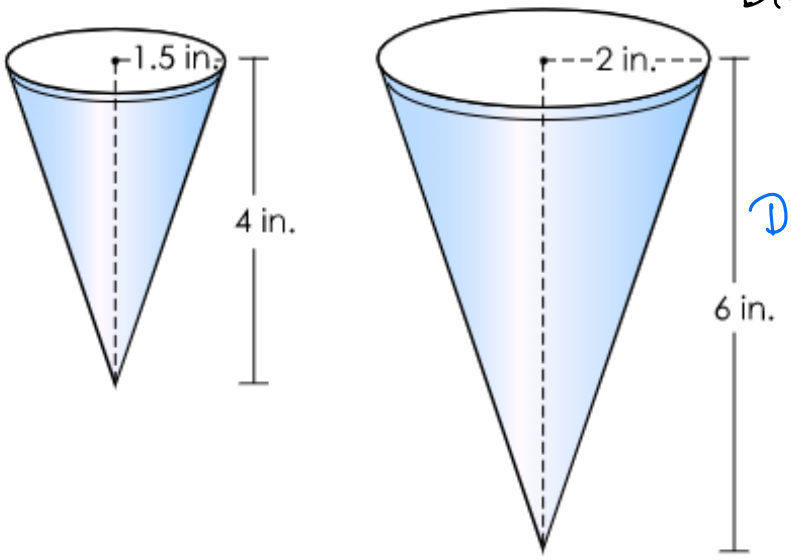
Empty Space $= V_{cube} - V_{sphere}$

$= (12 \cdot 12)(12) - \frac{4}{3}\pi(6)^3$

Empty $= 823.22$

---

8 A doctor's office is deciding between buying 2 different sized cups.



The Diff $= V_{BIG} - V_{Small}$

$= \frac{1}{3}\pi(2)^2 6 - \frac{1}{3}\pi(1.5)^2 4$

Diff ≈ 15.71

The 2 cups are shown. Before deciding which size cup to buy, they determine how much water each size cup can hold.

How much more water, in cubic inches, can the larger cup hold than the smaller cup? Round your answer to the nearest hundredth.

15.71 ***cubic inches***

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9 The volume of a cylinder is 90 cubic centimeters.

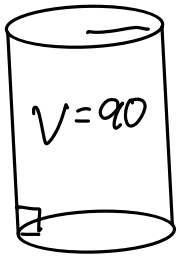
Which step can be performed to find the volume of a cone with the same radius and height as the cylinder?

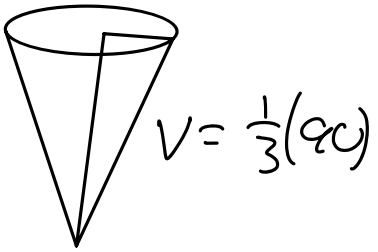
(A) divide the volume of the cylinder by π

(B) divide the volume of the cylinder by 3

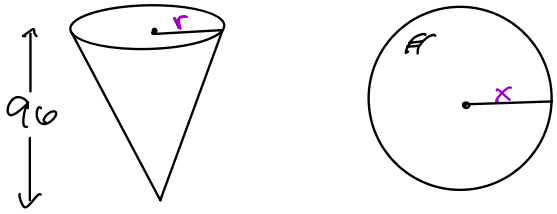
(C) divide the volume of the cylinder by the height

(D) divide the volume of the cylinder by the radius





#6



$V_{Cone} = \frac{1}{3}Bh$

$V = \frac{1}{3}\pi r^2(96)$

$V = \frac{4}{3}\pi r^3$

$V = \frac{4}{3}\pi x^3$

$\frac{96}{3}\pi r^2 = \frac{4}{3}\pi x^3$

$96r^2 = 4x^3$

$24r^2 = x^3$

Choose $r=1$

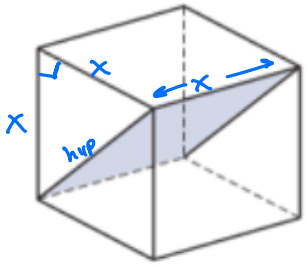
$24(1)^2 = x^3$

$24 = x^3$

$\sqrt[3]{24} = x$

$\sqrt[3]{24^1} = 24^{1/3}$

10 A cube is sliced as shown.

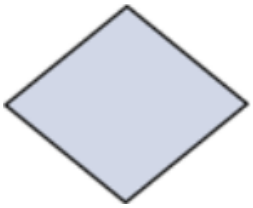


What is the shape of the cross section?

(A) Rectangle



(B) Rhombus



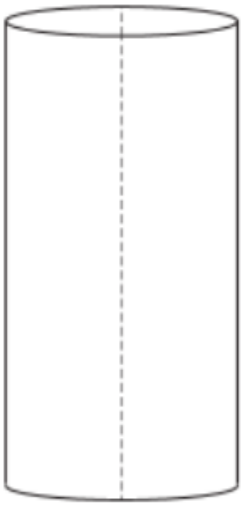
(C) Square



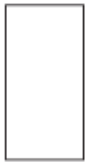
(D) Trapezoid



11 A cylinder is sliced vertically along a dotted line, as shown.



Which two-dimensional shape is created from this cross section?

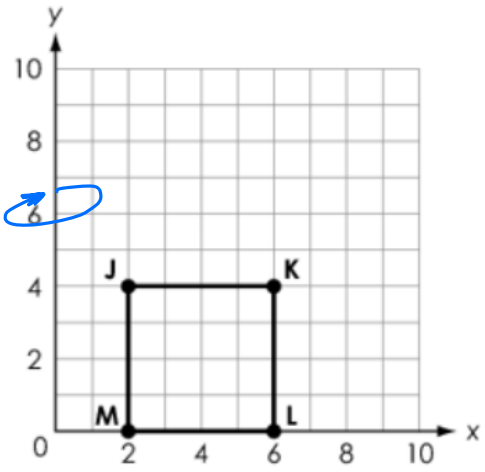
A 

B 

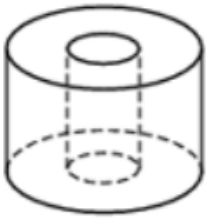
C 

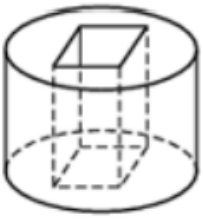
D 

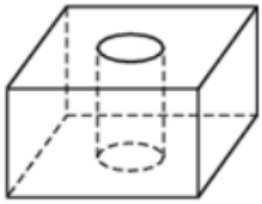
12 Square $JKLM$ is shown.

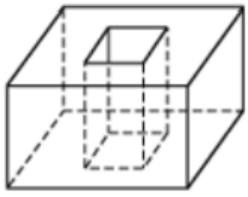


Which three-dimensional figure could result from rotating square $JKLM$ 360° clockwise about the y-axis?

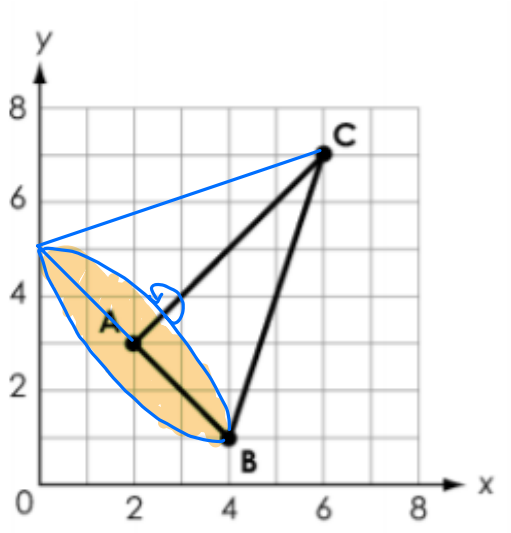
(A)


(B)


(C)


(D)


13 Triangle ABC is shown.



Which three-dimensional figure results from rotating the triangle $360°$ about $\overline{AC}$?

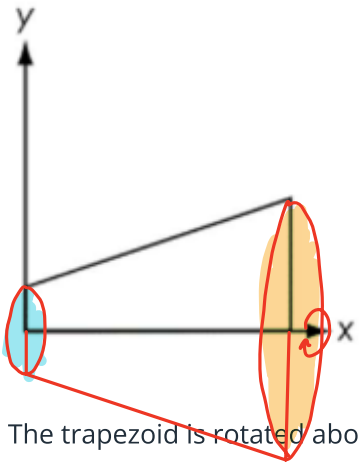
(A) cone

(B) cylinder

(C) pyramid

(D) sphere

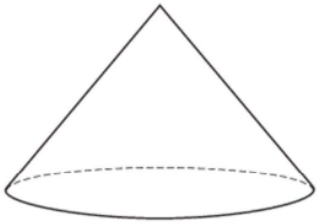
14



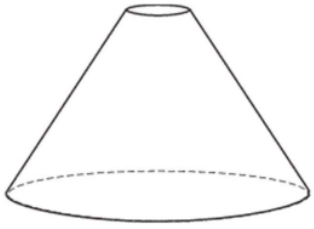
A trapezoid is shown on a coordinate grid. The trapezoid is rotated about the x -axis.

What is the resulting shape?

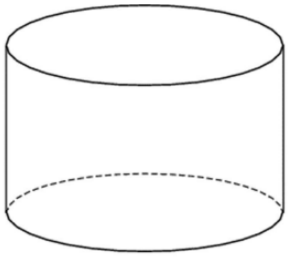
A



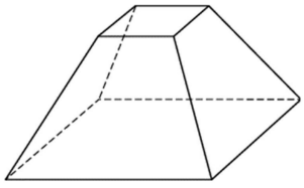
B



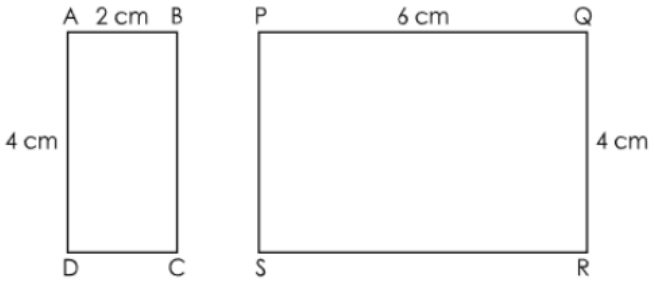
C



D



15 Consider the two rectangles shown.



Complete the sentence to determine whether the rectangles are similar.

Rectangle $ABCD$ [a] similar to rectangle $PQRS$ because [b] ,so rectangle $ABCD$ [c] dilated to fit exactly over rectangle $PQRS$.

a
- ○ is
- ✓ is not

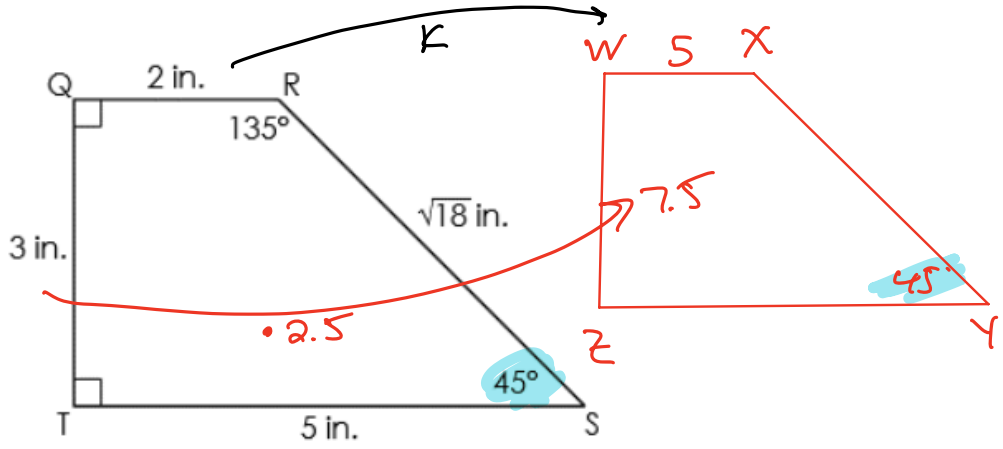
b
- ○ all rectangles are similar
- ○ all quadrilaterals are similar
- ○ their corresponding sides are congruent
- ○ their corresponding sides are not congruent
- ○ their corresponding sides are proportional
- ✓ their corresponding sides are not proportional

c
- ○ can be
- ✓ cannot be

---

16 Quadrilateral $QRST$ is shown, with side lengths in inches (in.) and angle measurements in degrees.

$2k = 5$
$k = 2.5$



Lynn draws quadrilateral $WXYZ$, which is similar to quadrilateral $QRST$, with $WX = 5$ in.

Enter values in the blank boxes to make the statement true.

The length of $\overline{WZ}$ is [7.5] inches and the measure of angle Y is [45] degress.

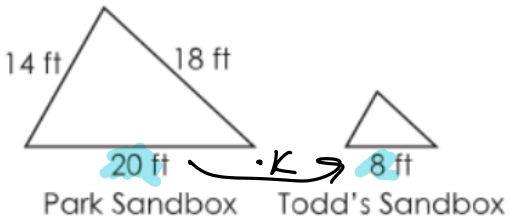
17 A park has a triangular sandbox. Todd wants to create a smaller sandbox at his backyard having the same angles as the park sandbox.

Similar

Drawings of both sandboxes are shown.

$P = 14 + 18 + 20$

$P = 52$



Scale FACTOR

$20 \cdot K = 8$

$K = \frac{2}{5}$

What is the perimeter, in feet (**ft**), of Todd's sandbox?

$P_{Todd} = \frac{2}{5}(52)$

20.8 ft

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18 The area of triangle QRS is 24 square centimeters. Triangle QRS is scaled by a factor of 4 to create triangle TUV.

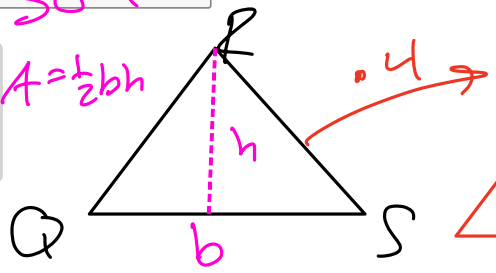
Complete the statement of describe a way to find the area of triangle TUV.

To find the area of triangle TUV, a mult the area of triangle QRS by 16.

The area of triangle TUV is 384 square centimeters.

a
- divide
- multiply

$A = \frac{1}{2}bh$



$A = \frac{1}{2}(4b)(4h)$

