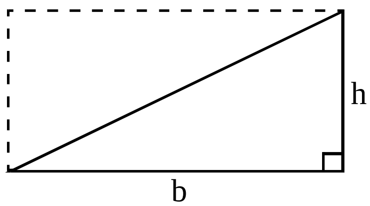
Area Review

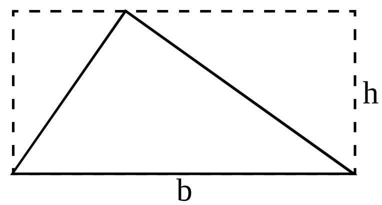
Geometry

Area of a triangle:
The area of a triangle can be found with the following formula:

$$A = \frac{1}{2}bh \quad \textbf{or} \quad A = \frac{bh}{2}$$

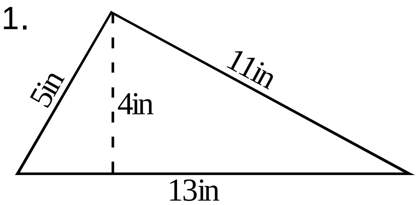
You can see why this works with the following diagrams:



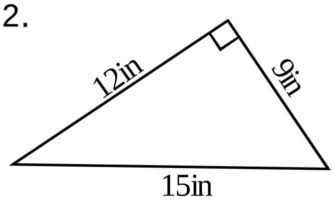


Solve: Find the area of each triangle.

1.



2.



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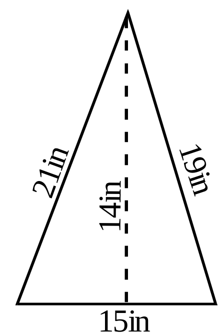
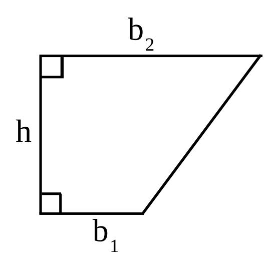


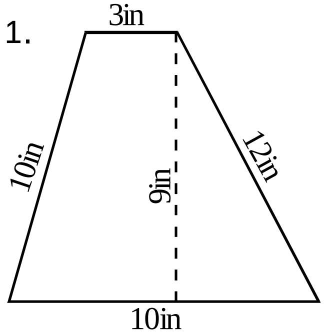
Area of a trapezoid:
The area of a triangle can be found with the following formula:

$$A = \frac{1}{2}h(b_1 + b_2) \quad \textbf{or} \quad A = \frac{h(b_1 + b_2)}{2}$$

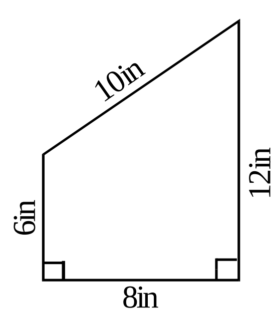


Solve: Find the area of each trapezoid.

1.



2.



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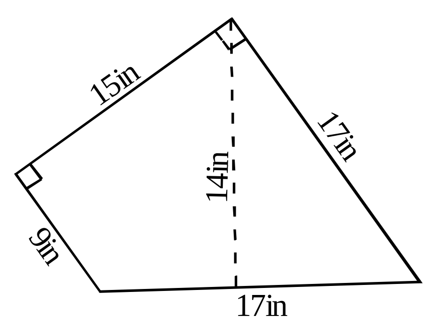


Area Review

Geometry

Area of a circle:

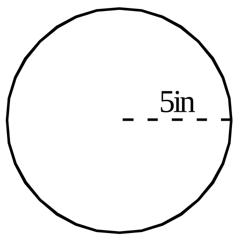
The area of a circle can be found with the following formula: $A = \pi r^2$

Circumference of a circle looks similar: $C = 2\pi r$ or $C = \pi d$

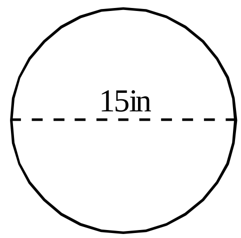
Area and circumference of a circle:

Find the area and circumference of each:

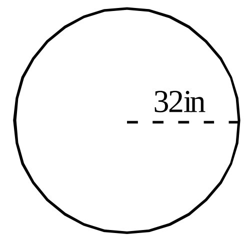
1.



2.



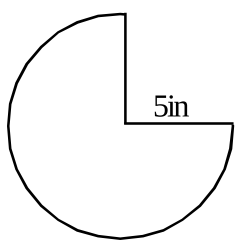
3.



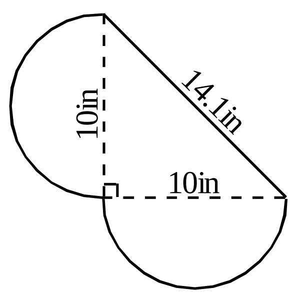
Combinations:

Find the area and perimeter of each:

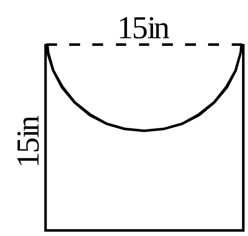
1.



2.



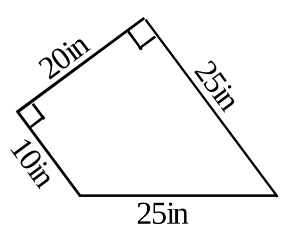
3.



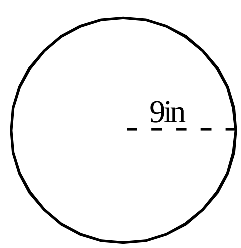
Review:

Find the area and perimeter/circumference of each:

1.



2.



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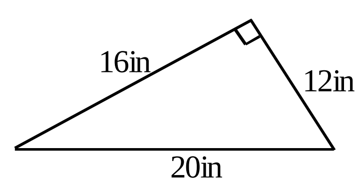


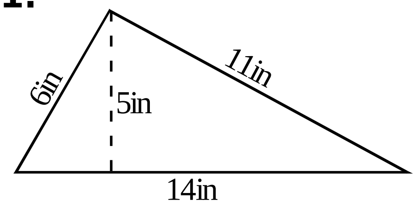
Name_________________________ Period _____

Area Practice

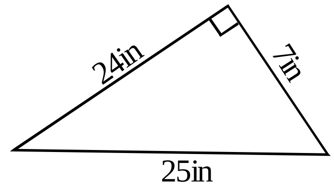
Geometry

Find the area of each: For #7-12 find the circumference/perimeter.
ROUND TO THE TENTH WHERE APPLICABLE.

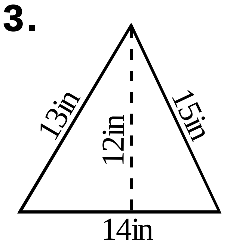
1.



2.

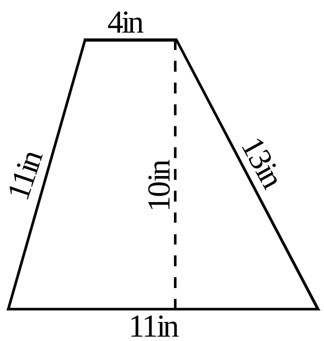


3.

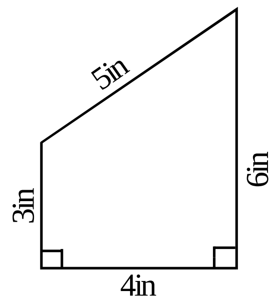


1. ________ **2.** ________ **3.** ________

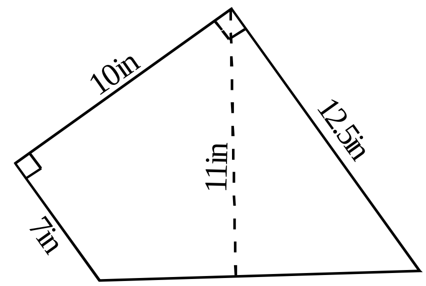
4.



5.

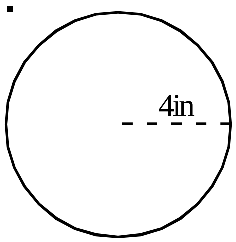


6.

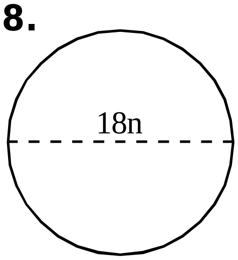


4. ________ **5.** ________ **6.** ________

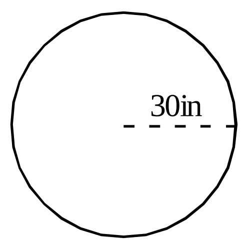
7.



8.

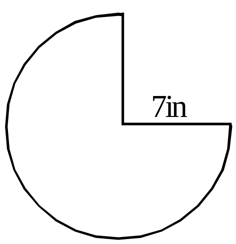


9.

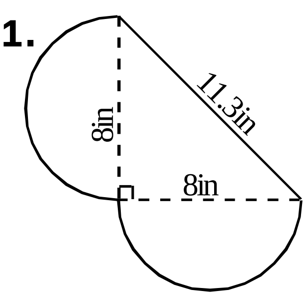


7. A:______ **C:** ______ **8. A:** ______ **C:** ______ **9. A:**______ **C:** ______

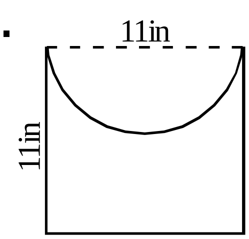
10.



11.



12.



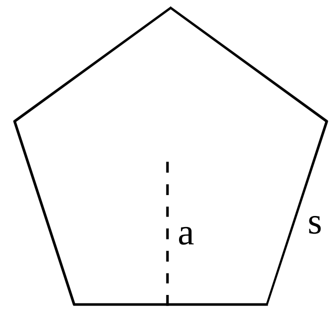
10. A: ______ **P:** ______ **11. A:** ______ **P:**______ **12. A:** ______ **P:** ______

Name_________________________ Period _____

Area of Regular Polygons

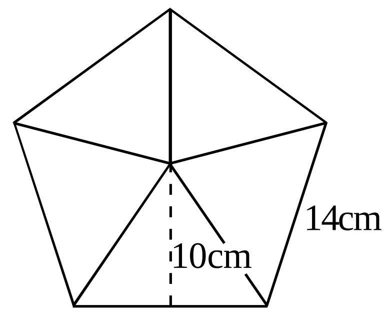
Geometry

What formula could be used to determine the area (A) of a regular polygon given the:
Number of sides: n
Side length: s
Apothem (inradius): a



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

This is easiest to think about as finding the area of **n** triangles with base **s** and height **a**.



The area of the pentagon to the right is:

$$A = \frac{1}{2} \cdot 10 \cdot 14 \cdot 5 = 350\ cm^2$$

How can this formula be simplified given the perimeter P of the polygon?

Find the area of each regular polygon below: **<u>Round to the tenth.</u>**

1. A nonagon (9 sides) whose side length is 12cm and whose apothem is 16.5cm?

____

2. A hexagon whose sides measure 6 inches and whose apothem is 5.2 inches.

____

3. An octagon whose sides measure 61 inches and whose apothem is 74 inches.

____

4. A heptagon whose apothem measure 10.25 inches and whose sides are 10 inches long.

____

5. A polygon whose perimeter is 60 inches and whose apothem is 8.5 in?

____

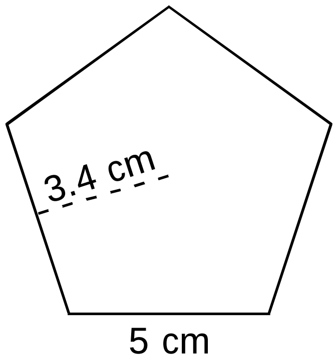
Name________________________ Period _____

Area of Regular Polygons

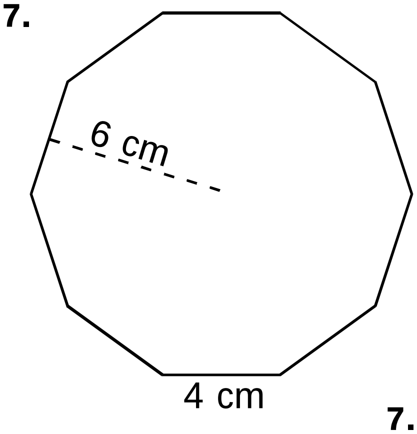
Geometry

Determine the area of each figure below:

6.



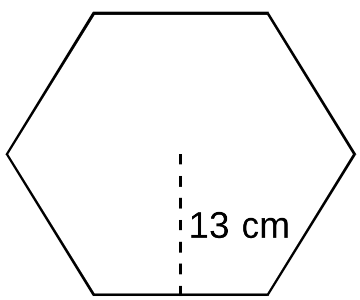
7.



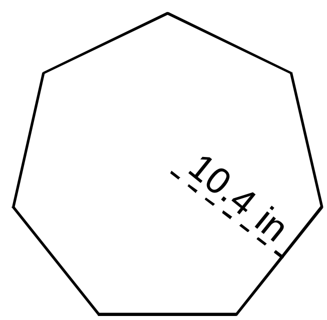
6. ______ **7.** ______

What is the perimeter of each figure below?
(round to the tenth)

8. Area = $585cm^2$



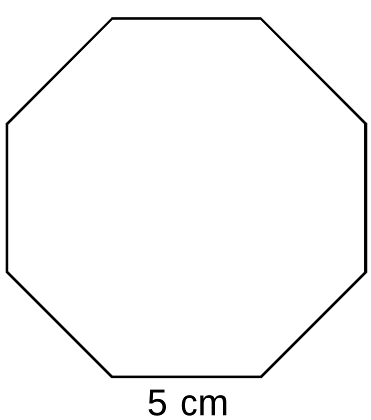
9. Area = $364\ in^2$



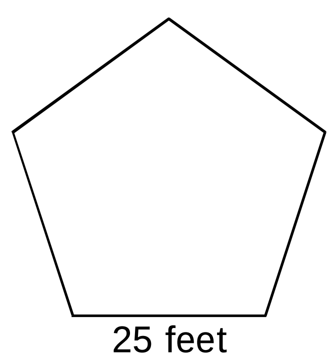
8. ______ **9.** ______

What is the apothem of each regular polygon below?
(round to the tenth)

10. Area = $121\ cm^2$



11. Area = $1075\ ft^2$



10. ______ **11.** ______

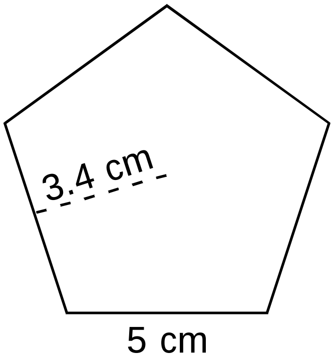
Name_________________________ Period _____

Area of Regular Polygons

Geometry

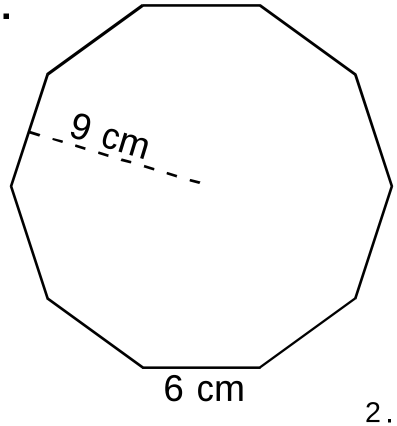
Determine the area of each regular polygon below:

1.



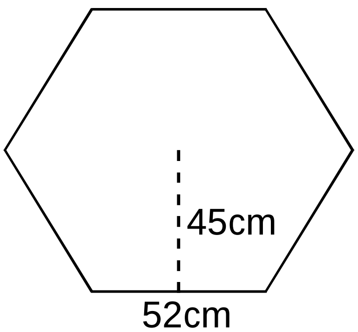
1. ______

2.

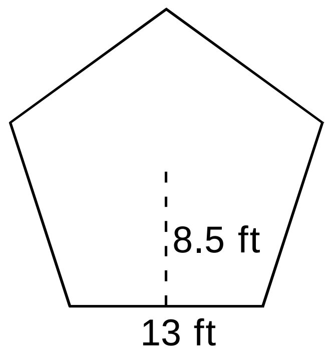


2. ______

3.



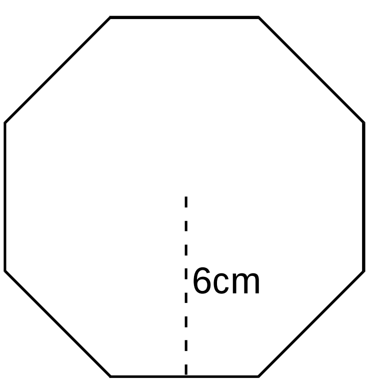
4.



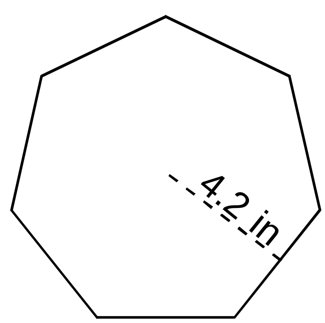
3. _______ **4.** _______

Given the area, what is the side length of each figure below?
(round to the tenth)

5. Area = $120.7 in^2$



6. Area = $58 in^2$

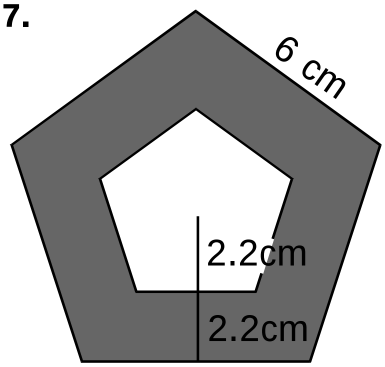


5. _______ **6.** _______

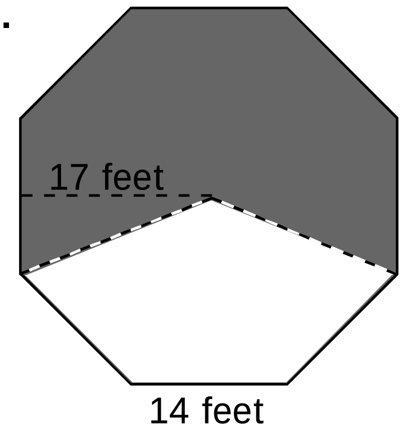
Polygon Area:

Determine the area of each shaded area below: (to the tenth)
(all polygons shown are regular)

7.



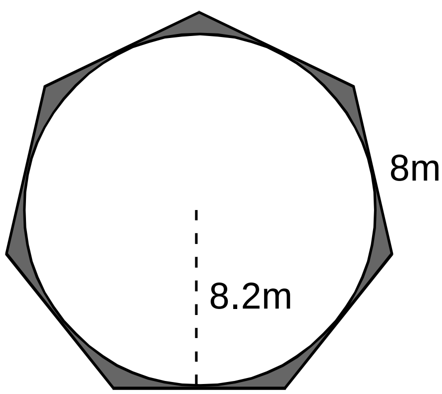
8.



7. ______

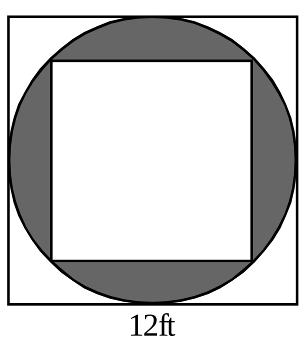
8. ______

9. Find the area of the shaded region below:
Round to the tenth.



9. ______

10. Challenge: Find the area of the shaded region below:
Round to the tenth.



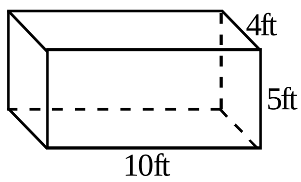
10. ______

Name________________________ Period _____

Surface Area

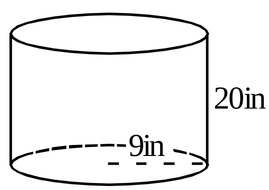
Geometry

Surface Area is the sum of the areas of all faces which enclose a solid.
You should alreay be able to find the surface area of basic solids like those below:



Be methodical!
Two ends: $4 \times 5 \times 2 = 40ft^2$
Front and back: $10 \times 5 \times 2 = 100ft^2$
Top and bottom: $10 \times 4 \times 2 = 80ft^2$

Surface area = $40 + 100 + 80 = 220ft^2$



Top and bottom = $2(3.14 \times 9^2) = 508.68in^2$
(remember the formula for area of a circle is πr^2

Rectangular 'wrap' = $2 \times 3.14 \times 9 \times 20 = 1130.4in^2$
(remember the formula for area of a the 'wrap' is $(2\pi r)h$

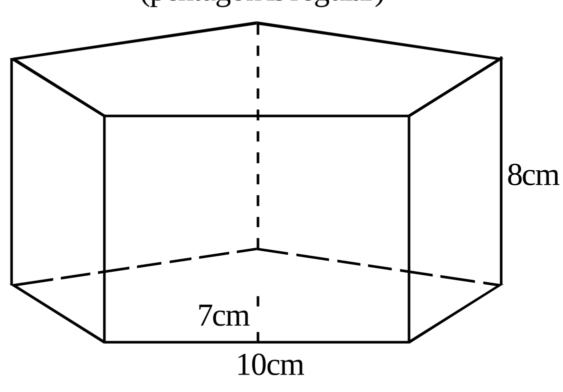
Total surface area: $1639.08in^2$.

Prisms have identical bases connected by parallelograms (generally rectangles).

To find the surface area of a prism, simply add the area of the bases to the area of the lateral faces (sides).

Example:

(pentagon is regular)



Be methodical!
The pentagons are regular:
Each pentagon:
A = $1/2 \times 7 \times 10 \times 5 = 175cm^2$
times 2 = $350\ cm^2$

Five lateral faces:
A = $8 \times 10 = 80\ cm^2$
times 5 = $400\ cm^2$

Total surface area =
$350 + 400 = 750cm^2$

Review practice:

1. What is the surface area of a 3-inch tall cylinder with a 7-inch radius?

____

2. What is the surface area of a 9-foot tall prism whose bases are regular hexagons. Each hexagon has 12-foot sides and a 10-foot apothem.

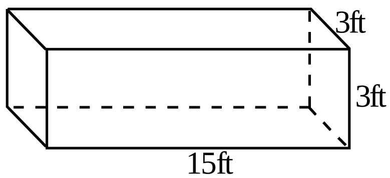
____

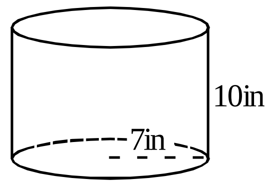
Name________________________ Period _____

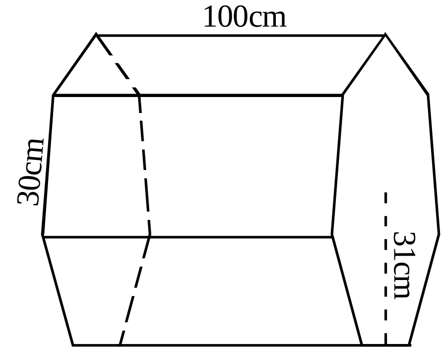
Surface Area

Geometry

Determine the surface area of each solid below:
Round all answers to the hundredth.
Work on a separate sheet.





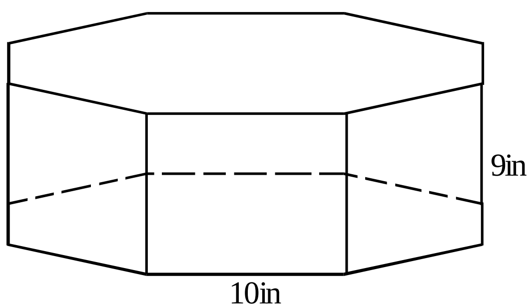


3. A = ________

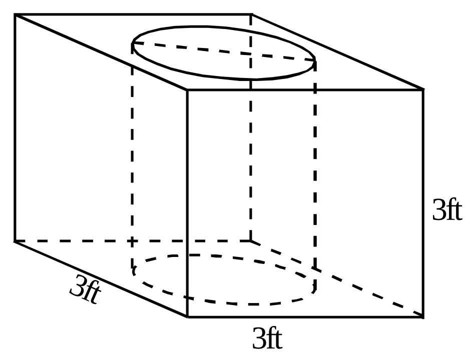
4. A = _______

5. A = ______

octagon apothem = 12 inches

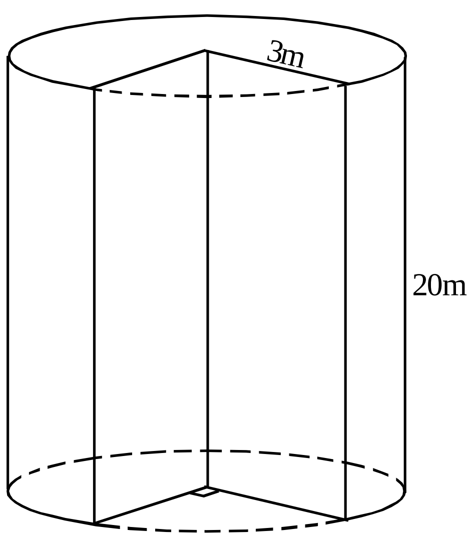


circle diameter = 2ft

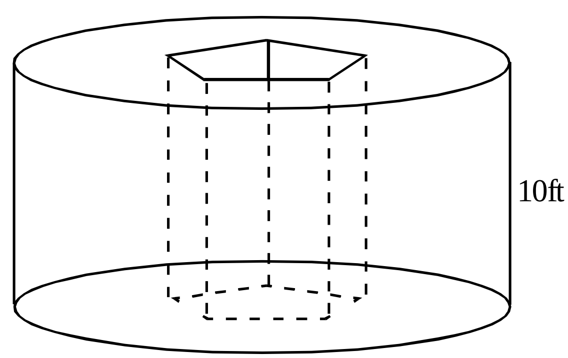


6. A = ________

7. A = ________



Circle radius: 12ft
Pentagon sides: 3ft
Pentagon apothem: 2ft



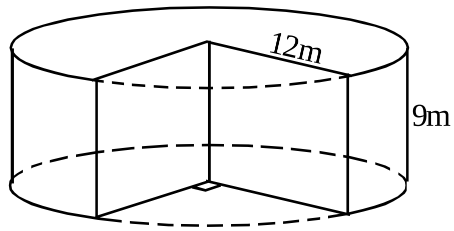
8. A = ________

9. A = ________

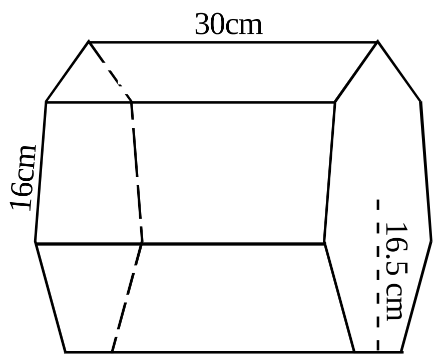
Surface Area:

Geometry

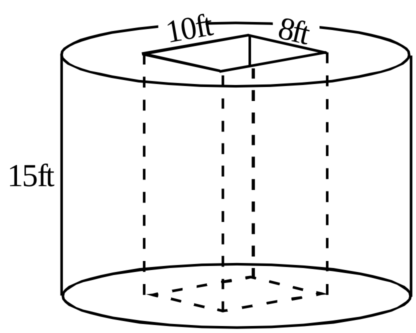
Find the surface area of each:



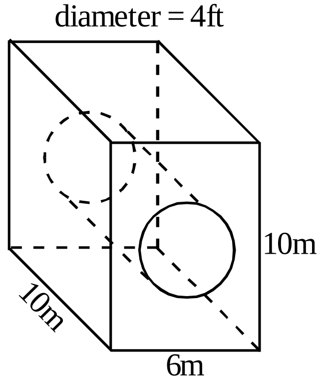
There are 5 surfaces.



There are 9 surfaces.



There are 7 surfaces.



There are 7 surfaces.

Name_________________________ Period _____

Prism/Cylinder Volume

Geometry

The formula used to find the volume of a prism or cylinder:

$$V = Bh$$

Where B is the area of the base and h is the height.

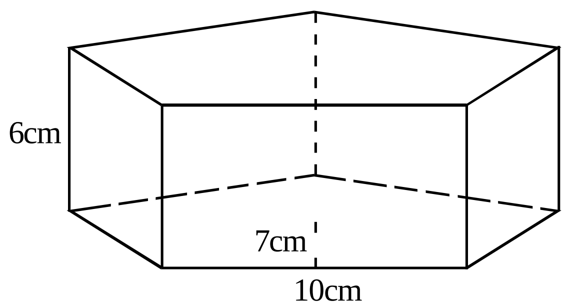
This applies whether the figure is **right or oblique** (Oblique means slanted. Height is measured along the altitude).

Practice:

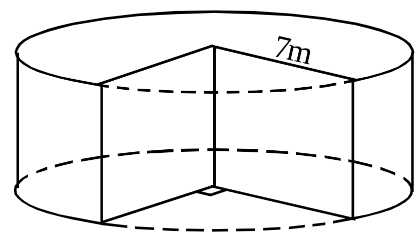
Find the volume of each solid. Round to the tenth.

1.

(pentagon is regular)



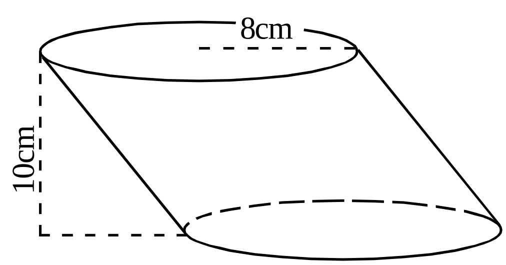
2.



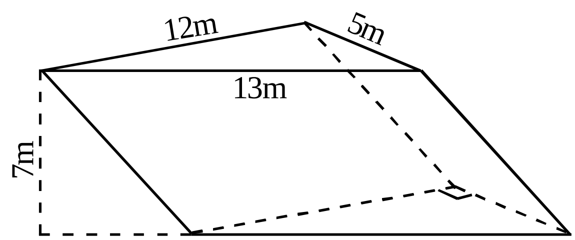
1. _______

2. _______

3.



4.

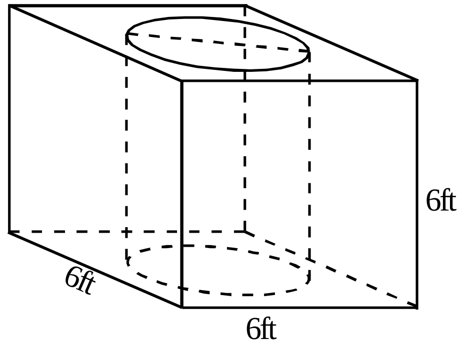


3. _______

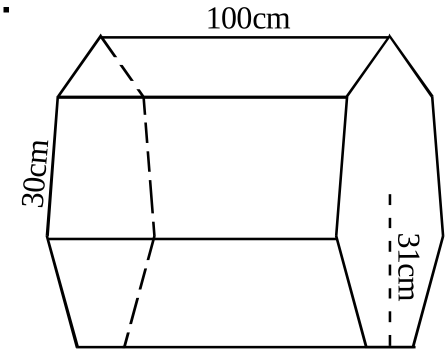
4. _______

5.

circle diameter = 4ft



6.



5. _______

6. _______

Name________________________ Period _____

Pyramid/Cone Volume

Geometry

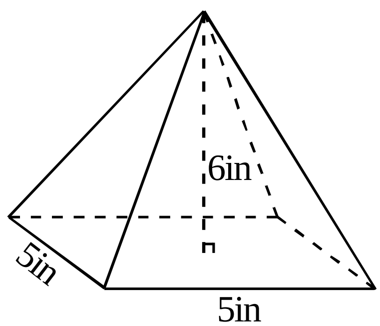
The formula used to find the volume of a pyramid or cone:

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

Where B is the area of the base and h is the height.
This applies whether the figure is **right or oblique** (height is measured along the altitude).

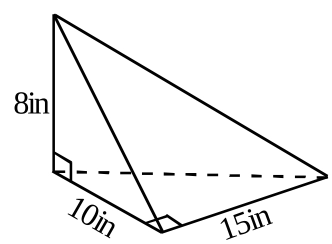
Practice:
Find the volume of each solid.

7. (square-based pyramid)



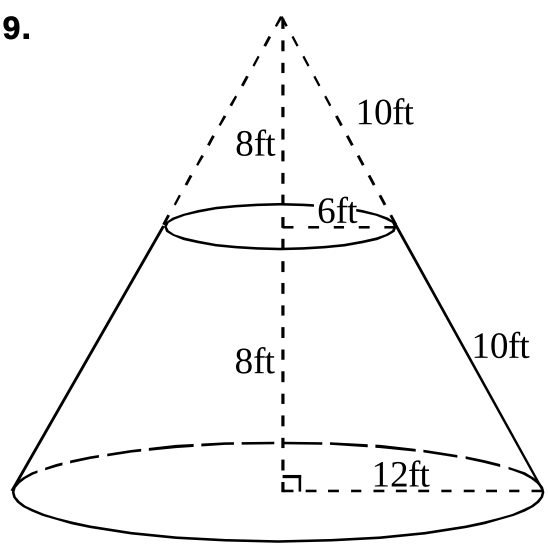
7. ______

8. (triangle-based pyramid)



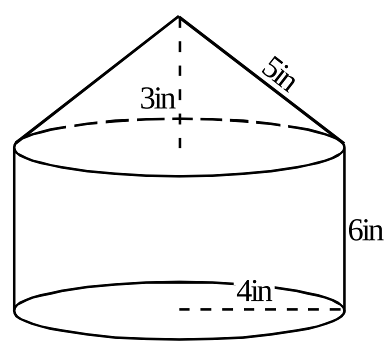
8. ______

9.



9. ______

10.



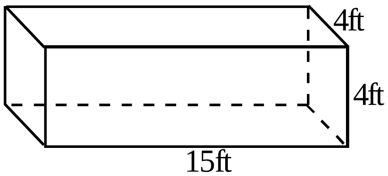
10. ______

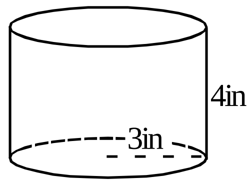
Name_________________________ Period _____

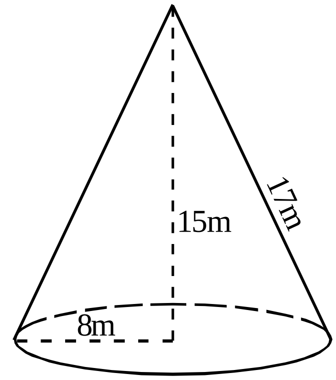
Volume Practice

Geometry

Determine the volume of each solid below:
Round all answers to the hundredth.
Work on a separate sheet.



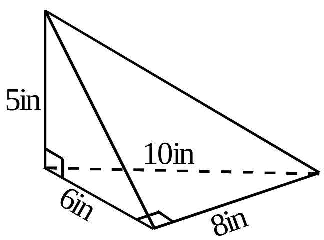


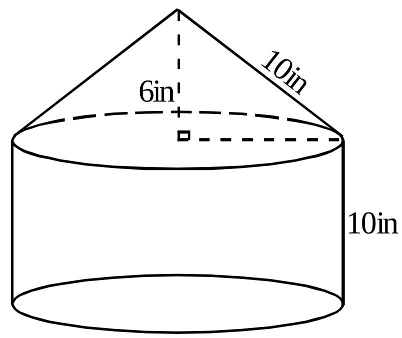


1.V = ________

2. V = _______

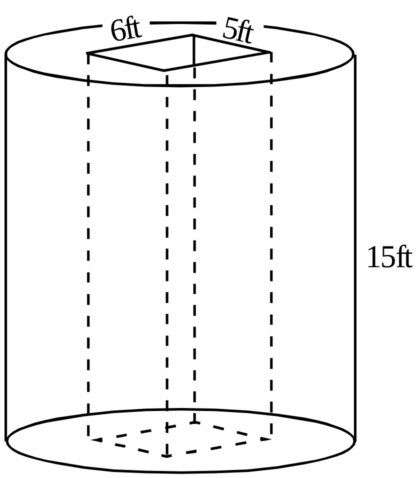
3. V = ______



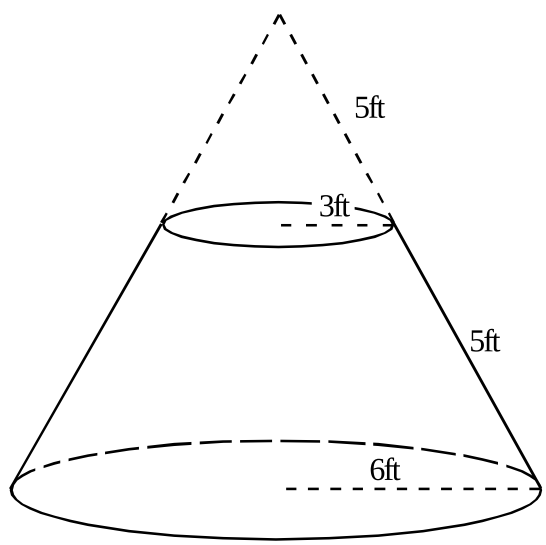


4. V = ________

5. V = ________



cylinder diameter = 10ft



6. V = ________

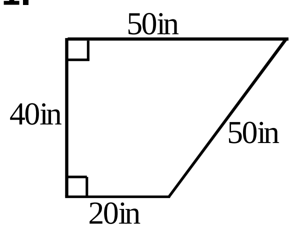
7. V = ________

Review

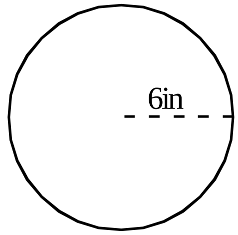
Geometry

Determine the area of each: Round to the tenth.

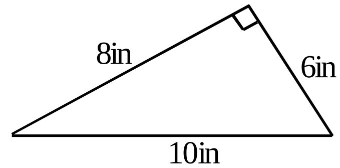
1.



2.

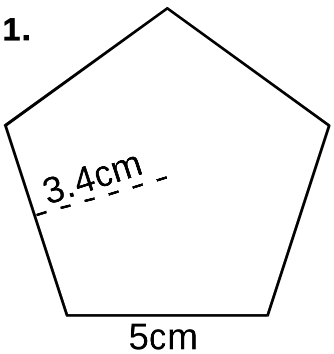


3.

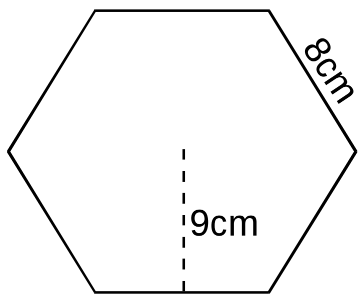


Determine the area of each: Round to the tenth.

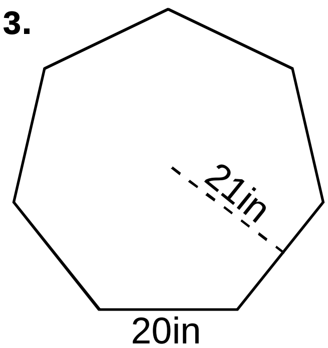
1.



2.

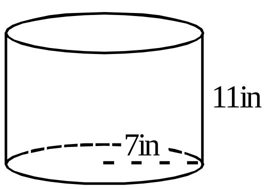


3.

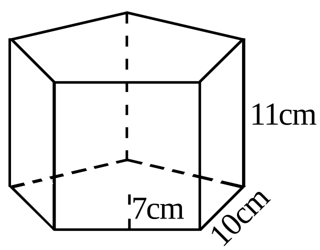


Determine the surface area of each: Round to the tenth.

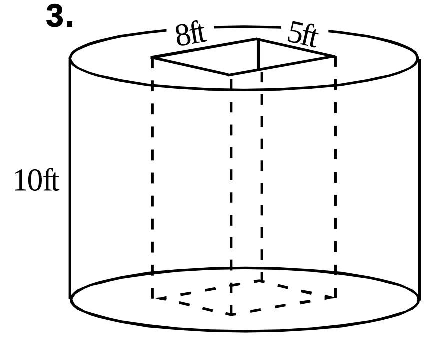
1.



2.



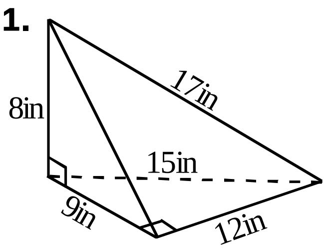
3.



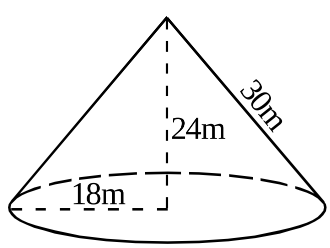
cylinder diameter = 12ft

Determine the volume of each: Round to the tenth.

1.

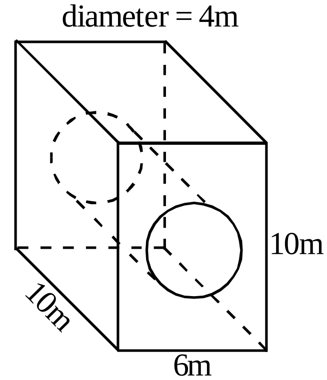


2.



3.

diameter = 4m

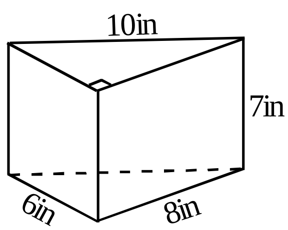


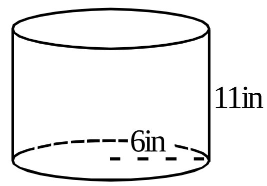
Name________________________ Period _____

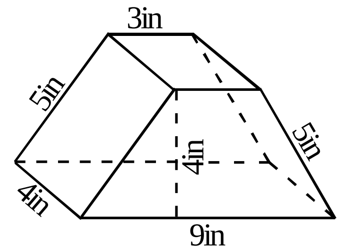
Surface Area and Volume

Geometry

Determine the surface area and volume for each:







1. A = ________

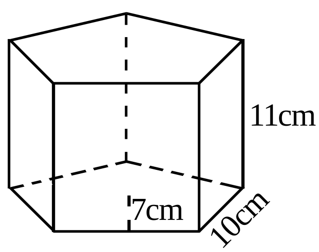
V = ________

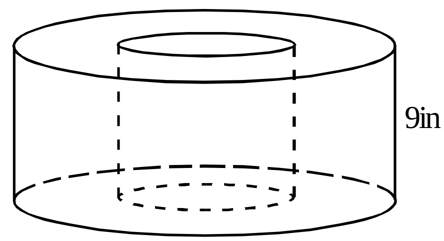
2. A = _______

V = _______

3. A = ________

V = ________





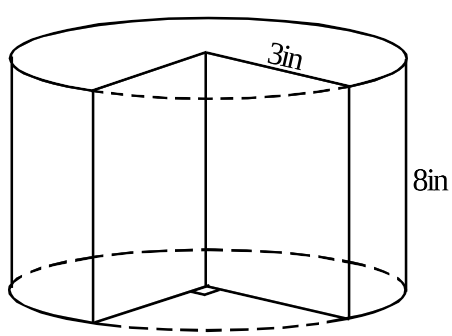
Small Circle Radius: 4in
Large Circle Radius: 8in

4. A = ________

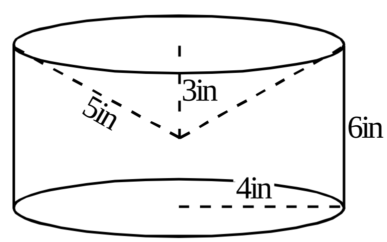
V = ________

5. A = ________

V = ________



(cylinder with a cone-shaped hole)



6. A = ________

V = ________

7. V = ________

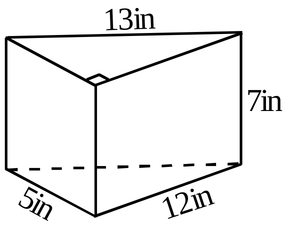
(no surface area on this one)

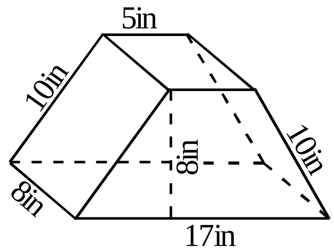
Name_________________________ Period _____

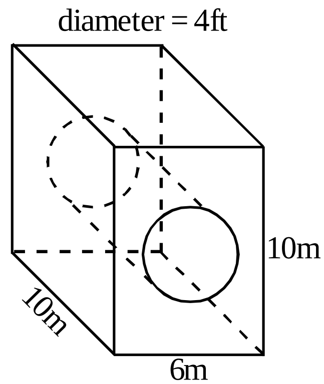
Surface Area and Volume

Geometry

Determine the surface area and volume for each:







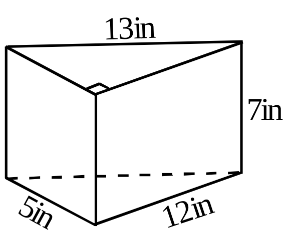
1. A = ________ **2. A =** _______ **3. A =** ________

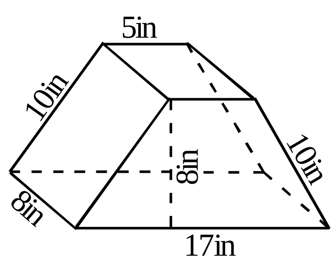
V = ________ **V =** _______ **V =** ________

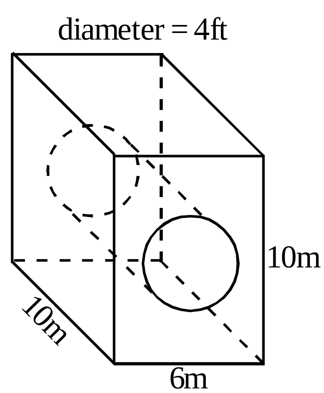
Name_________________________ Period _____

Surface Area and Volume

Determine the surface area and volume for each:







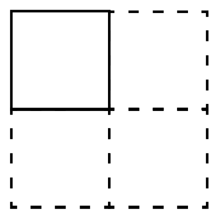
1. A = ________ **2. A =** _______ **3. A =** ________

V = ________ **V =** _______ **V =** ________

Changing Dimensions

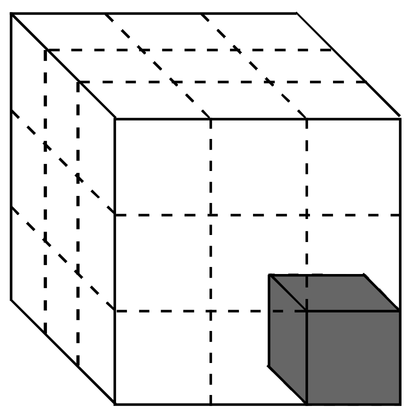
Changing the dimensions of an object effects the area and volume. Here are some easy examples:

Ex: A square is enlarged so that the length of each side is doubled. If the area of the original square was 7 square inches, what will be the area of the enlarged square?



2x2=4 times bigger.

Ex: A cube has one-inch edges. How many times larger is the volume of a cube with edges that are three times longer?



3x3x3=27 times bigger.

If you increase the dimensions of an object, the volume increases by the product of those increases.

Example:
The volume of a rectangular prism is $10in^3$. You double the length, width, and height. What will the new volume be?

Practice:
1. The area of a reactangle is $15cm^2$. If you triple the length and double the width, what will the area of the new rectangle be?

2. A cube has a volume of $2cm^3$. Will a cube that has 8 times more volume be twice as tall, three times as tall, 4 times as tall, or 8 times as tall?

3. What happens to the area of a circle when you triple its radius?

Changing Dimensions

Geometry

Practice:
Solve each.

1. A rectangular prism is 3x4x5 inches. How many times greater is the volume of a 6x8x15 rectangular prism? (If you are not sure, find each volume and divide).

2. When the sides of a triangle are 6 inches long, the area of the triangle is about 15.6 square inches. What would be the area of an equilateral triangle whose sides are 2 inches long? (round to the tenth)

3. A large circle has 81 times the area of a small circle. If the radius of the large circle is 45 inches, what is the radius of the small circle?

Practice:
Solve each.

1. The radius and height of a cone are tripled. What effect does this have on the cone's volume?

2. The radius of a cylinder is doubled, but the height is not changed. If the original cylinder had a volume of $4cm^3$, what is the volume of the new cylinder?

3. A cylinder and a cone have the same base and equal volumes. If the cylinder is 15 inches tall, how tall is the cone?

Practice:
Solve each.

1. The length and width of a rectangular pyramid are tripled, and the height is doubled. How many times larger is the new pyramid than the original?

2. The dimensions of a cube are increased by 50% (1.5 times). If the original cube had a volume of $16in^3$, what is the volume of the new cube?

3. You have a square sheet of construction paper. You want a sheet that has twice the area. How many times wider will the new sheet be?

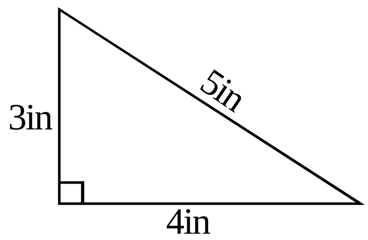
Name__________________________ Period ______

Changing Dimensions

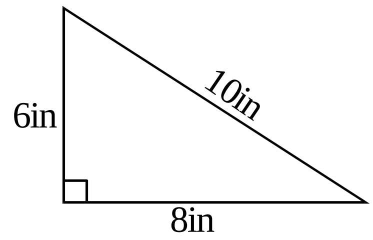
Geometry

Complete the following area problems:

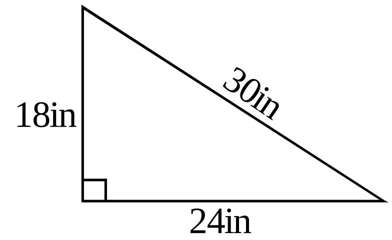
1.



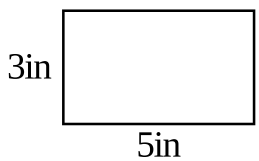
2.



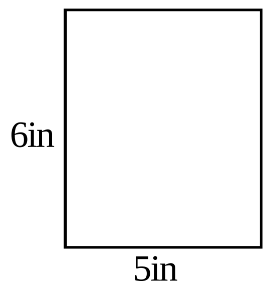
3.



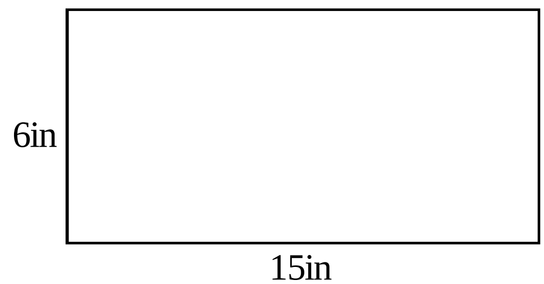
4.



5.

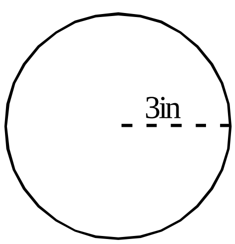


6.

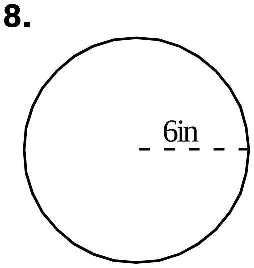


Leave answers below in terms of Pi.

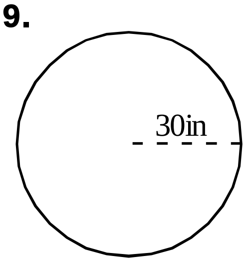
7.



8.



9.



Complete the following area problems:

10. What happens to the area of a square when you:

a. Double the sides. b. Triple the sides. c. Halve the sides.

________________________ ____________________ __________________

11. What happens to the volume of a cylinder when you:

a. Double the radius only. b. Triple the height only.

________________________ ____________________

c. Double the radius and triple the height.

____

12. A rectangle has an area of 12cm². What will the area be if you:

a. Triple all sides. b. Multiply all sides by 1.5.

________________________ ________________________

Name________________________ Period _____

Changing Dimensions

Geometry

Practice:
Solve each.

13. A rectangular prism is 2x4x7 inches. How many times greater is the volume of a 6x8x7 rectangular prism? (If you are not sure, find each volume and divide).

14. When the sides of a pentagon are 6 inches long, the area of the pentagon is about 63 square inches. What would the area of a pentagon whose sides are 2 inches long?

15. A large circle has 36 times the area of a small circle. If the radius of the large circle is 24 inches, what is the radius of the small circle?

16. The radius and height of a cylinder are tripled. What effect does this have on the volume?

17. The radius of a cylinder is doubled, and the height is multiplied by 5. If the original cylinder had a volume of $10cm^3$, what is the volume of the new cylinder?

18. A right triangle has an area of $6in^2$. If all the dimensions are multiplied by 4, what will the area of the new triangle be?

19. The length and width of a rectangular pyramid are doubled, and the height is tripled. How many times larger is the new pyramid than the original?

20. The dimensions of a cube are increased so that they are 2.5 times longer. If the original cube had a volume of $8in^3$, what is the volume of the new cube?

Name________________________ Period _____

Changing Dimensions

Geometry

Practice:
Solve each.

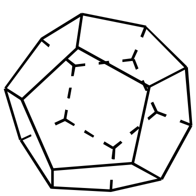
1. The area of a circle is 30in^2. If you triple the circle's radius, what will its new area be?

2. When a hexagon has 2-inch sides, its area is about 10.4in^2. What will be the approximate area of a hexagon whose sides are 10 inches long??

3. A rectangular prism has a volume of 17cm^2. If you double the length and width, but leave the height unchanged, what will be the volume of the new prism?

4. If you want to double the area of a square, by what percent should you increase the length of its sides.
hint: Try using a 10-inch square, double its area, and find the length of the sides of the new square.

5. The volume of the regular dodecahedron below with an edge length of 4-inches is about 490 in^3. What would be the volume of a regular dodecahedron whose edges are a foot long?



6. The volume of a cone is 3in^3. What would be the volume after each modification below? (each part refers to the original figure).

a. Double the radius only. ________________

b. Triple the height only. ________________

c. Double the height and triple the radius. ________________

d. Increase the height and radius by 50%. ________________

7. If you want to double the volume of a cube, by what percent should you increase the edge length?

a.20% b.23% c.26% d.30% e.40%

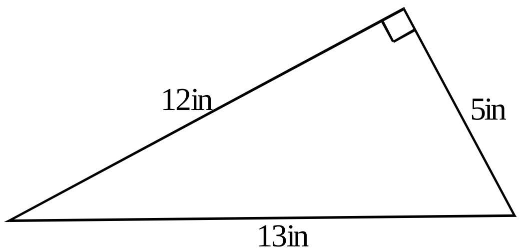
Name_________________________ Period _____

Area and Volume Practice Test

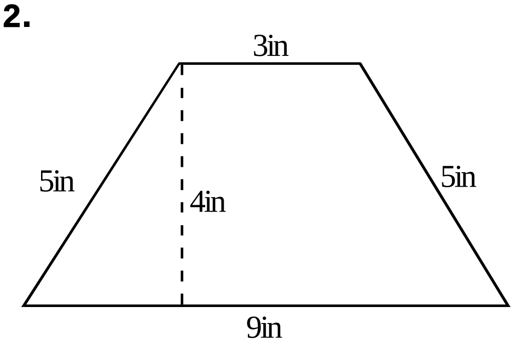
Geometry

Determine the area of each figure below.
Round to the tenth. Figures not to scale.

1.



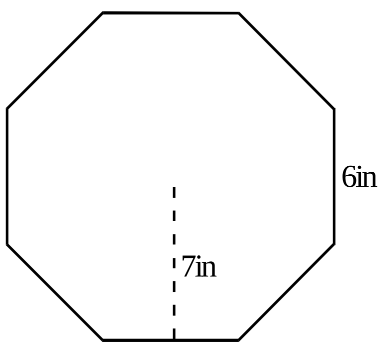
2.



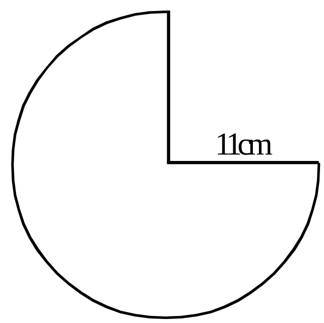
1. __________

2. __________

3.



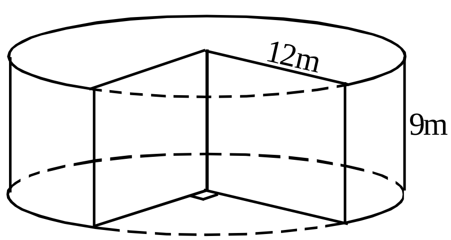
4.

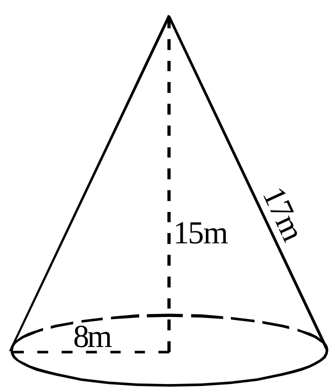


3. __________

4. __________

Determine the volume for each figure below:
(figures not to scale, round to the tenth)





5. Volume = ________

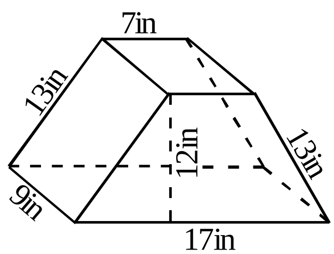
6. Volume = ________

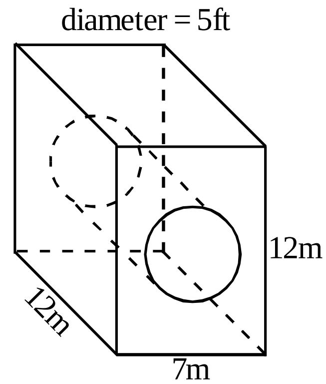
Name________________________ Period _____

Area and Volume Practice Test

Geometry

Determine the surface area for each figure below:
(figures not to scale, round to the tenth)





7. Surface Area = _______

8. Surface Area = ______

Solve each problem involving changing dimensions:

9. A rectangular prism has a volume of 5cm^3. If you triple the length, width, and height, what will the volume of the enlarged prism be?

9. ___________

10. When the radius of a circle is multipled by 4, the area of the new circle is 40 in^3. What was the area of the original circle?

10. ___________

11. The volume of a rectangular pyramid is 7m^3. What is the volume of a pyramid that is twice as tall, three times as long, and four times as wide?

11. ___________

12. A cube has edges that are 6 centimeters long. How many times greater is the volume of a cube with 9 centimeter sides?

12. ___________

Pledge and sign: