Area Review

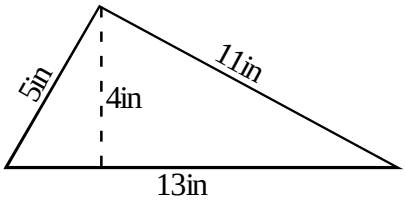
Geometry

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

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

Solve: Find the area of each triangle.

1.



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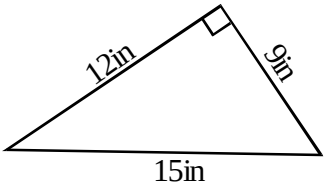

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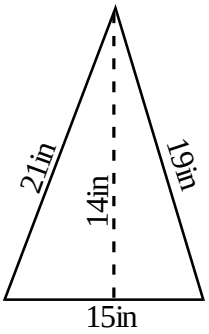
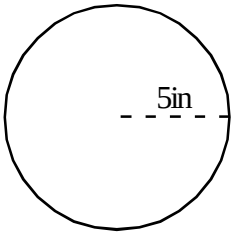


Area of a circle:
The area of a circle can be found with the following formula: $A = \pi r^2$
Circumference of a circle looks similar: $C = 2\pi r$ or $C = \pi d$

Area and circumference of a circle:
Find the area and circumference of each. Leave your answers in terms of pi.

1.



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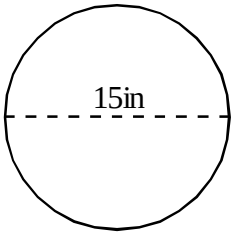

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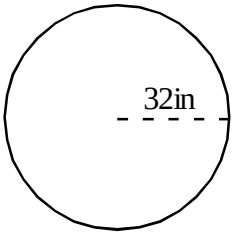
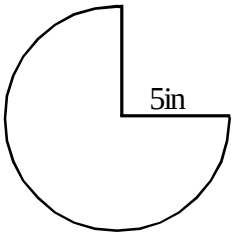


Combinations:
Find the area and perimeter of each. Round decimal answers to the tenth.

1.



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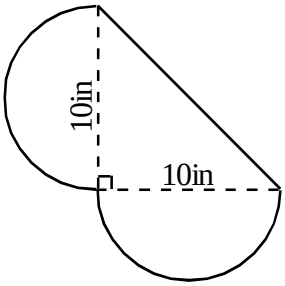

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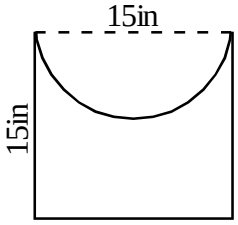
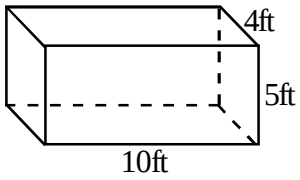


Name_____ Period _____

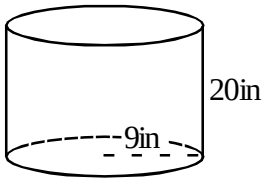
Surface Area and Volume

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:



Rectangular Prism:
Two ends: 4 x 5 x 2 = 40ft^2
Front and back: 10 x 5 x 2 = 100ft^2
Top and bottom: 10 x 4 x 2 = 80ft^2
Surface area = 40 + 100 + 80 = 220ft^2



Cylinder:

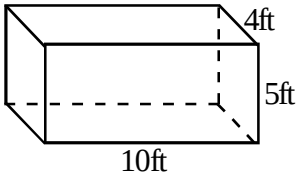
Top and bottom = $2\pi(9)^2$ = 508.68in^2
(remember the formula for area of a circle is πr^2

Rectangular 'wrap' = $2\pi(9)(20)$ = 1130.4in^2
The formula for area of a the 'wrap' is $2\pi rh$
Total surface area: 1639.08in^2.

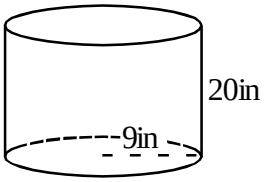
Volume: The formula used to find the volume of a prism or cylinder:

$$V = Bh$$

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



The base can be any of the six faces. We will use the 10 x 4 side. The volume is the area of the base times the height: (10 x 4) x 5 = 200ft^3.



The base is a circle of area $\pi(9)^2 = 81\pi$.
Multiply this by the height to get $20(81\pi) = 1620\pi$ in^3.
As a decimal, this equals 5,089.4 in^3, but we often leave answers in terms of pi to avoid rounding.

Practice:

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

SA:_____in^2 V:_____in^3

2. What is the surface area and volume of a 4 by 6 by 7 rectangular prism?

SA:_____in^2 V:_____in^3

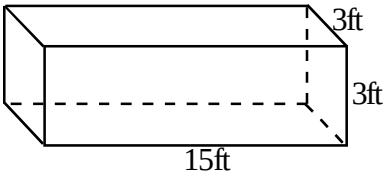
Name_____ Period _____

Surface Area and Volume

Geometry

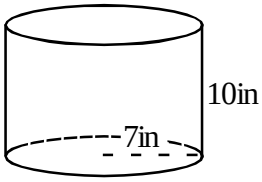
Determine the surface area and volume of each. These problems require careful notes. COMPLETE THE WORK ON A SEPARATE SHEET and round all decimal answers to the tenth.

1.



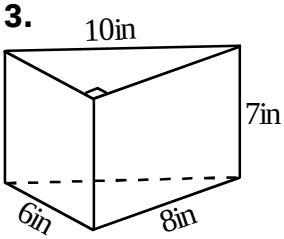
1. SA: _____ Vol. _____

2.



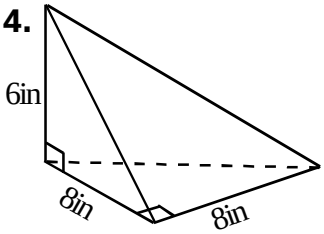
2. SA: _____ Vol. _____

3.



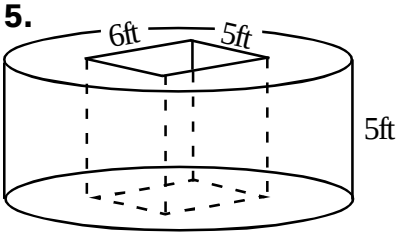
3. SA: _____ Vol. _____

4.



4. SA: _____ Vol. _____

5.

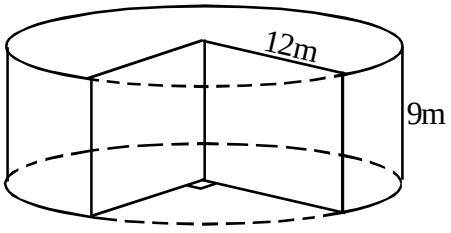


cylinder diameter = 10ft

note:
The rectangular hole passes all the way through the cylinder.

5. SA: _____ Vol. _____

6.



note:
The portion removed is 1/4 of the total volume.

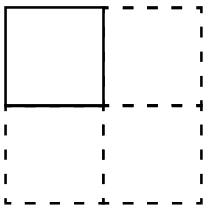
6. SA: _____ Vol. _____

Changing Dimensions

Geometry

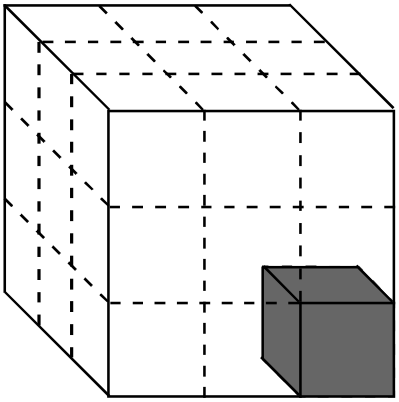
Changing the dimensions of an object effects the area and volume. Here are some easy examples:

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?



2 x 2 = 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?



3 x 3 x 3 = 27 times bigger.

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

Examples:

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

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

Practice:

1. 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?

2. What happens to the area of a circle when you triple its radius? (Try a few examples to check).

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 an equilateral 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 cylinder are tripled. What effect does this have on the cylinder'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 circle has an area of $10cm^2$. If the radius of the circle is increased by 25%, by what percent will the area of the circle increase?

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?

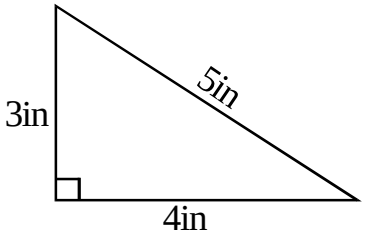
Name_____ Period _____

Changing Dimensions

Geometry

Complete the following area problems:

1.



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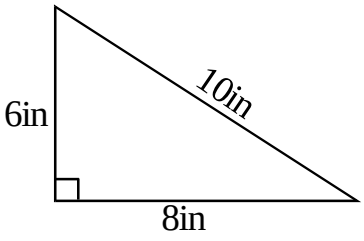

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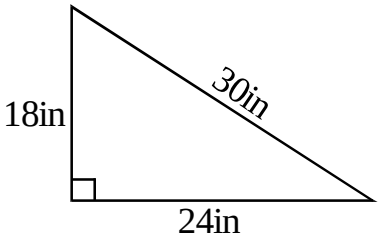

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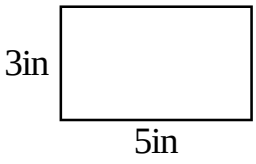

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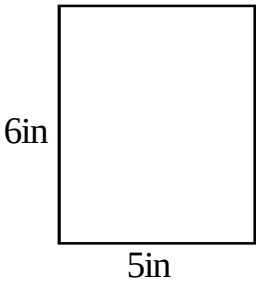
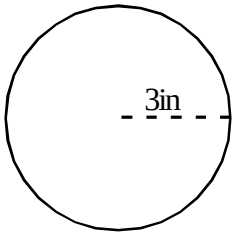


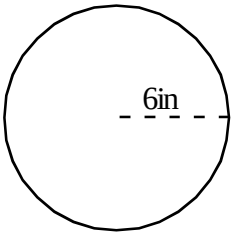
6.

Leave answers below in terms of Pi.

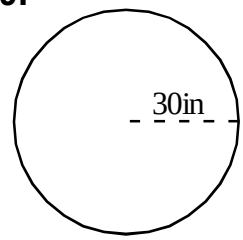
7.



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 be 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?

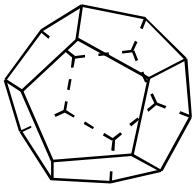
2. When a hexagon has 2-inch sides, its area is about $10.4in^2$. What will be the approximate area of a hexagon whose sides are 10 inches long??

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?

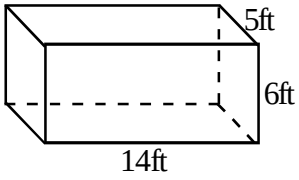
a.20% b.23% c.26% d.30% e.40%

Name_____ Period _____

Dimensions Practice Quiz

Geometry

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



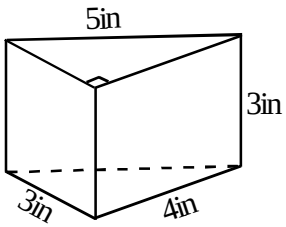
1. What is the volume of the prism above?

1. _____

2. What is the surface area of the prism above?

2. _____

3. What would the volume be if all three dimensions were doubled?



3. _____

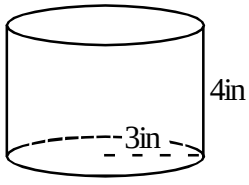
4. What is the volume of the prism above?

4. _____

5. What is the surface area of the prism above?

5. _____

6. What would the surface area be if all three dimensions were tripled?



6. _____

7. In terms of pi, what is the surface area of the cylinder above?

7. _____

8. In terms of pi, what is the volume of the cylinder above?

8. _____

9. If the radius is doubled and the height remains unchanged,
how many times greater will the volume of the new cylinder be?

9. _____

Name_____ Period _____

Dimensions Practice Quiz

Geometry

Solve each problem involving changing dimensions:

10. A small pizza has a radius of 10 inches, and a medium pizza has a radius that is 20% larger. How much more pizza do you get with the medium pizza than with the small pizza? Express your answer as a percent.

10. _____

11. 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?

11. _____

12. 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?

12. _____

13. 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?

13. _____

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

14. _____