Palsson_Geometry_Circles_Week#4

Student Name:
Teacher Name: Palsson
Class Name/Subject: Geometry
Period:
Assignment Week #: 4
Due date: May 15 (take a photo and email me if you can!)

YOU ONLY NEED TO DO THIS PAPER VERSION WORK <u>IF YOU DO NOT HAVE ACCESS TO INTERNET.</u>
IF YOU DO HAVE ACCESS TO INTERNET, GO TO mpalsson.weebly.com EVERY DAY TO SEE WHAT YOU NEED TO DO.

I RECOMMEND THAT WHEN YOU ARE DONE WITH THIS WORK, <u>TAKE A PHOTO</u> OF <u>YOUR SOLUTIONS</u> AND <u>EMAIL IT</u> TO ME AT mpalsson@tusd.net

THIS WAY YOU WILL GET YOUR GRADE MUCH FASTER THAN IF YOU TURN IN YOUR SOLUTIONS TO THE KHS OFFICE,

Also, feel free to email me if you have any questions.

$$x^2 = 49$$
$$\sqrt{x^2} = \pm\sqrt{49}$$
$$x = \pm 7$$

Perfect square on the left side (and right side in this problem) .

When solving an equation involving a perfect square (such as $x^2 = 49$ seen at the left), taking the square root of both sides of the equation quickly yields the result.

This same square rooting process works nicely on equations with the square of a binomial on the left side (such as $(x + 1)^2 = 9$ as seen at the right). We could even replace $(x + 1)^2$ with $x^2 + 2x + 1$, and start with a **perfect square trinomial** on the left side.

$$(x+1)^2 = 9$$
$$\sqrt{(x+1)^2} = \pm\sqrt{9}$$
$$x+1 = \pm 3$$
$$x = -1 \pm 3$$
$$x = 2; \quad x = -4$$

Statement: Creating a perfect square trinomial on the left side of a quadratic equation, with a constant (number) on the right, is the basis of a method called **completing the square.**

In plain English, we are going to "force" a perfect square trinomial on the left hand side of the equation to help us find the solution more quickly.

To solve quadratic equations by Completing the Square:

1. Check to see if the leading coefficient is one. If not, divide each term by the leading coefficient.	$x^2 + 4x - 2 = 0$ Leading coefficient is one.
2. If there is a constant term on the left side of the equation, move the constant term to the right side.	$x^2 + 4x = 2$
3. Set up the problem to receive the addition of the value which will create a perfect square trinomial on the left side. Inserting boxes may remind you to add the value to BOTH sides of the equation.	$x^2 + 4x + \square = 2 + \square$
4. To get the needed value for creating a perfect square trinomial, take half of the coefficient of the middle term (x-term) and square it. Add this value to both sides of the equation (put this value in the boxes). Take half and square $x^2 + 4x + \square = 2 + \square$ coefficient of "middle term"	$x^2 + 4x + \boxed{4} = 2 + \boxed{4}$ (Be sure to take note of the "sign" of half the coefficient of the middle term, as it will be used when factoring the perfect square trinomial. In this case, +2.)
5. Factor the perfect square trinomial on the left side.	$(x + 2)^2 = 6$
6. Now that there is a perfect square on the left side, take the square root of both sides. Solve for x. Be sure to remember to use "plus and minus" to arrive at the two roots of the equation. Check your solutions in the original equation to see that they work. $\left.\begin{array}{l}\left(-2+\sqrt{6}\right)^2 + 4\left(-2+\sqrt{6}\right) - 2 = 0 \\ 10 - \cancel{2\sqrt{6}} - 8 + \cancel{2\sqrt{6}} - 2 = 0 \\ 0 = 0 \quad \textit{check}\end{array}\right\}$ repeat using $-2-\sqrt{6}$ Always assume that answers are to be left in "exact" form (not rounded), unless told otherwise..	$\sqrt{(x+2)^2} = \pm\sqrt{6}$ $(x+2) = \pm\sqrt{6}$ $x = -2 + \sqrt{6}$ $x = -2 - \sqrt{6}$ In real-world problems and for graphing, these values may be expressed as rounded decimal values: $x \approx 0.4494897428$ $x \approx -4.449489743$

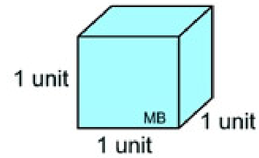
Volume and Unit Cubes:

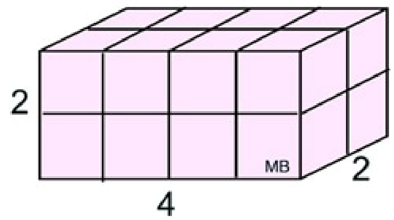
Volume is measured in cubic units. Think in three-dimensions.

The volume of an object can be represented by the number of **unit cubes** that can be placed within the object.

For some figures, the unit cubes fit "nicely" into the object, while other objects hold fractional parts of a unit cube.

Unit Cube

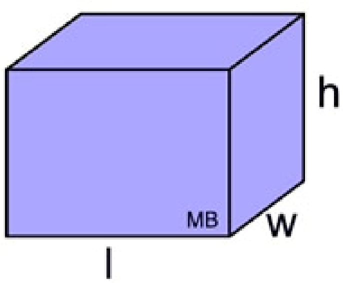




The volume of this rectangular prism ("box") is the total of the number of unit cubes it holds. There are a total of 16 unit cubes within the solid.

The volume = 16 cubic units

FOR THE FORMULAS BELOW, ONLY FOCUS ON THE V-FORMULAS, SKIP THE SA-FORMULAS. V STANDS FOR VOLUME.

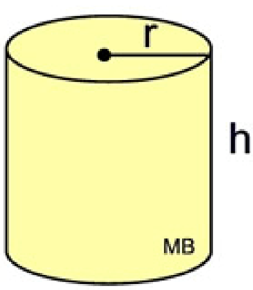


Rectangular Solid (Prism)

$$V = lwh$$

$$SA = 2lh + 2hw + 2lw$$

This formula assumes a "closed box", with all 6 sides.

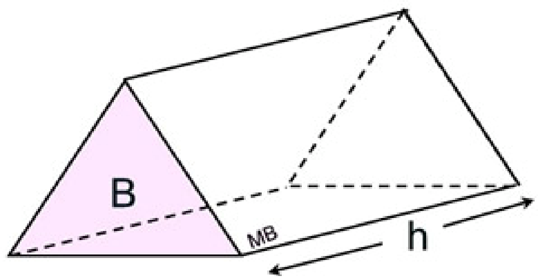


Cylinder

$$V = \pi r^2 h$$

$$SA = 2\pi rh + 2\pi r^2$$

This formula assumes a "closed container" with a top and bottom.



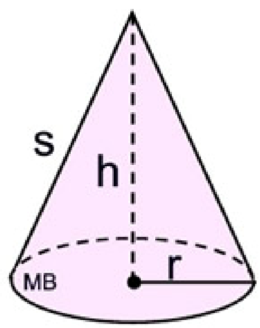
Prism (all forms)

$$V = Bh$$

B = area of end face; h = height (depth)

SA = sum of all surface areas

(2 triangular end faces and 3 rectangular faces)

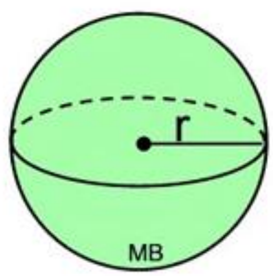


Cone

$$V = \frac{1}{3}\pi r^2 h$$

$$SA = s\pi r + \pi r^2$$

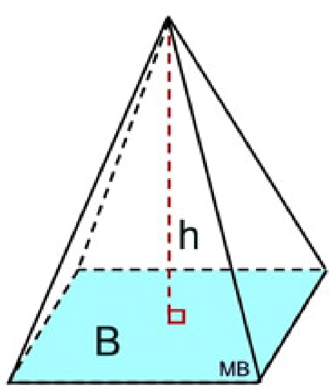
This formula assumes a "closed container", with a bottom.



Sphere

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

$$SA = 4\pi r^2 = \pi d^2$$



Pyramid

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

B = area of base; h = height

SA = sum of all surface areas

(1 base and all triangular faces)

Look at the examples above when you solve the problems below.

COMPLETE THE SQUARE FOR THE EQUATIONS BELOW:

3) $a^2 + 14a - 51 = 0$

4) $x^2 - 12x + 11 = 0$

5) $x^2 + 6x + 8 = 0$

6) $n^2 - 2n - 3 = 0$

7) $x^2 + 14x - 15 = 0$

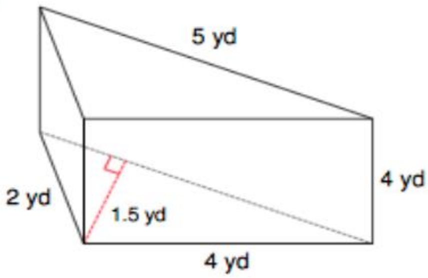
8) $k^2 - 12k + 23 = 0$

9) $r^2 - 4r - 91 = 7$

10) $x^2 - 10x + 26 = 8$

Find the volume of each figure. Round to the nearest tenth.

1)



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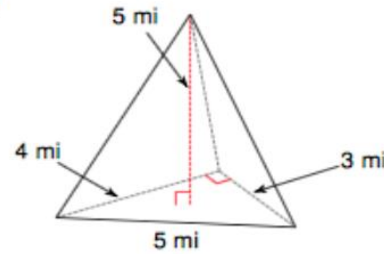
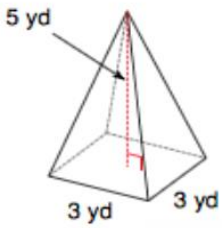


3)



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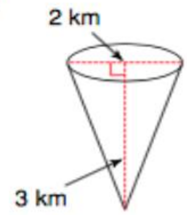

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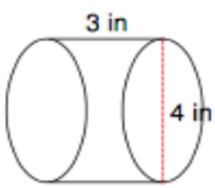

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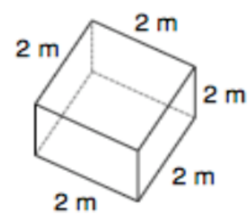

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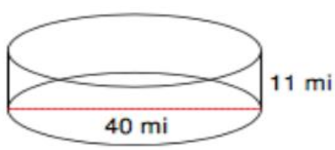

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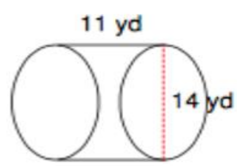
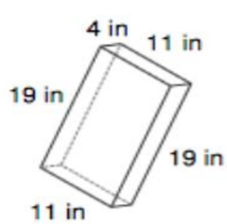


15)



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