MATH 8: Week of May 11

- Go through the slides (notes) and work through the examples on a separate piece of paper.
- Do the given practice problems.
- Check your answers with the key given (last slide).
- Take a photo or scan in your work and submit it in Google Classroom. If you have questions or would like feedback on your work, add that as a comment with your submitted work.
- The other option for turn in is to send it in on Monday when the new packet is available.
- Check your school email/google calendar for online help sessions via Zoom.

Day 1: Slides 2-6	Day 3: Slides 7-8
Day 2: Slides 9-18	Day 4: Slides 19-20

Answers on Slides 21-22

Day 1: Lesson 3-M

Volume of Spheres

Target: Find the volume of spheres and solve real-world problems involving spheres.

Vocabulary

Sphere

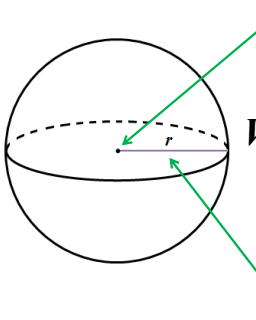
A round, curved, closed three-dimensional solid.

Good to know!

- ✓ A sphere has no edges, sides or vertices.
- ✓ All the points on the surface of a sphere are exactly the same distance from the center of the sphere. This distance is called the ***radius*** of the sphere.
- ✓ If something is "spherical," that means it is shaped like a sphere.

Volume of a Sphere

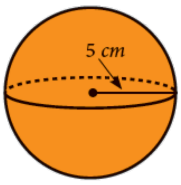
The volume (V) of a sphere is equal to four-thirds of the product of pi (π) and the cube of the radius (r^3).



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

Example 1

Find the volume of the sphere. Use 3.14 for π.



The radius of the sphere is 5 *cm*.

Use the formula for a sphere. $V = \frac{4}{3}\pi r^3$

Substitute known values for the variables. $V \approx \frac{4}{3}(3.14)(5)^3$

Find the value of the power. $V \approx \frac{4}{3}(3.14)(125)$

Multiply. $V \approx 523.33$

The volume of the sphere is about 523.33 cm^3.

Example 2

A water tower has a spherical tank. The diameter of the tank is 30 meters. How much water can the tank hold? Use 3.14 for π.

Find the length of the radius. $\text{Diameter} \div 2 = 30 \div 2 = 15$

Use the formula for a sphere. $V = \frac{4}{3}\pi r^3$

Substitute known values for the variables. $V \approx \frac{4}{3}(3.14)(15)^3$

Find the value of the power. $V \approx \frac{4}{3}(3.14)(3375)$

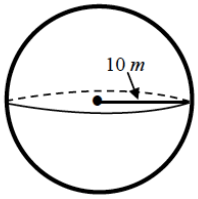
Multiply. $V \approx 14{,}130$

The tank can hold approximately 14,130 cubic meters of water.

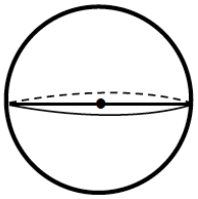
Day 1: L3-M Practice Problems:

Find the volume of each sphere. Use 3.14 for π. Round to the nearest hundredth.

1.



2. $d = 18\ cm$



3. Drake has a beach ball with a diameter close to 12 *in*. Find the volume of this beach ball.

4. A spherical juice container has a radius of 25 *mm*. How much juice can the container hold?

End Day 1

Day 2

Example 3

A bouncy ball has a volume of 113.04 cubic centimeters. Find the radius of the ball. Use 3.14 for π.

Use the formula for a sphere. $V = \frac{4}{3}\pi r^3$

Substitute known values for the variables. $113.04 \approx \frac{4}{3}(3.14)r^3$

Multiply. $113.04 \approx 4.19r^3$

Divide both sides of the equation by 4.19. $\frac{113.04}{4.19} \approx \frac{4.19r^3}{4.19}$

Cube root both sides of the equation. $27 \approx r^3$

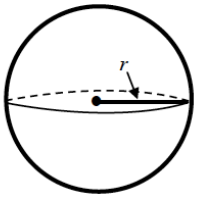
The radius of the bouncy ball is 3 *cm*. $\sqrt[3]{27} \approx \sqrt[3]{r^3}$

$3 \approx r$

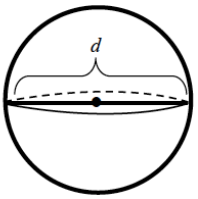
Day 2: L3-M Practice Problems:

Find each missing measure. Use 3.14 for π. Round to the nearest hundredth.

5. Volume $\approx 1436.03\ m^3$



6. Volume $\approx 7234.56\ in^3$



7. A bowling ball has a volume of 267.947 cubic inches. What is the radius of the bowling ball? Use 3.14 for π.

8. Geraldo's garden has a rainwater catcher in the shape of a sphere that has a volume of about 33.49 cubic feet. What is the diameter of the sphere? Use 3.14 for π.

End Day 2

Day 3: Lesson 3-N

Transformations

Target:

Perform single transformations on a figure including reflections, rotations, translations, and dilations.

Vocabulary

Transformation

A mapping of a point or figure that changes its position or size.

Pre-Image

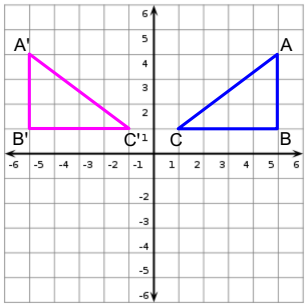
A point or figure before it is transformed.

△ABC is the pre-image

Image

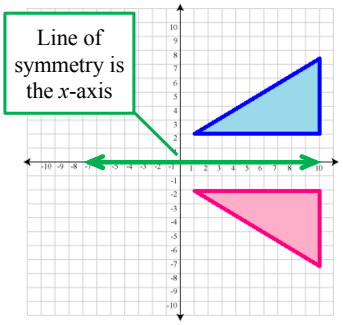
The point or figure resulting from a transformation.

△A'B'C' is the image



Good to know:
△A'B'C' is read "Triangle A prime, B prime, C prime"

Basic Transformations



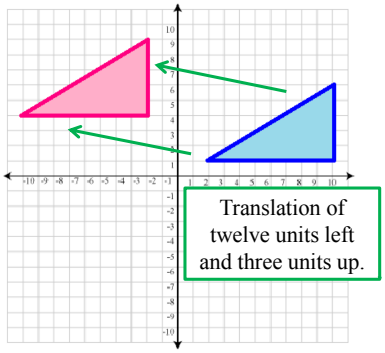
Reflection

- flips a figure over a line
- the figures will be mirror images of each other

Basic Transformations

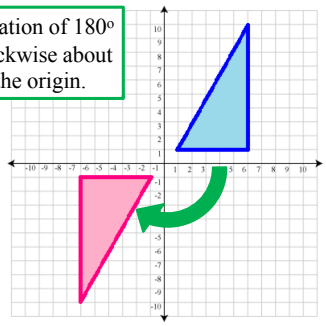
Translation

- slides a figure to a new position without turning it



Basic Transformations

Rotation of 180° clockwise about the origin.



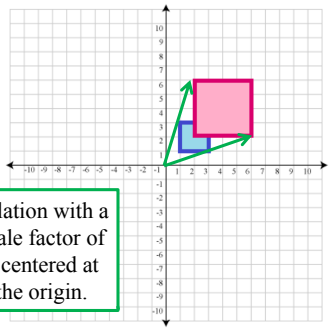
Rotation

- turns a figure about a fixed point, often the origin (0,0)

Basic Transformations

Dilation

- changes the size of a figure but not the shape
- the pre-image and image are similar figures



Dilation with a scale factor of 2 centered at the origin.

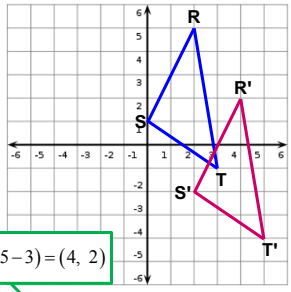
Example 1

A triangle with coordinates R(2, 5), S(0, 1), and T(3, −1) is translated 2 units to the right and 3 units down.

What are the coordinates of ΔR'S'T'?

Graph the *pre-image*, ΔRST (that is, the original figure).

Translate each point 2 units right (add 2 to the *x*-values) and 3 units down (subtract 3 from the *y*-values).



R':(2+2, 5−3)=(4, 2)

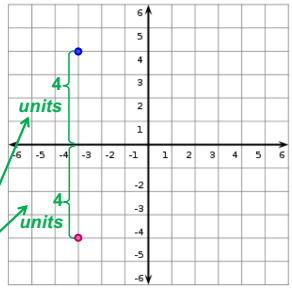
Write the ordered pairs for the coordinates of ΔR'S'T'.

R'(4, 2) S'(2, −2) T'(5, −4)

Example 2

The point (−3, 4) is reflected over the *x*-axis. What are the coordinates of its image?

Graph the *pre-image*, point (−3, 4), on a coordinate plane.



Flip the point over the *x*-axis.

The *image* of the point should be the same distance from the *x*-axis as the pre-image.

The coordinates of the image are (−3, −4).

Example 3

Find the coordinates of the image under a dilation with a scale factor of 2. Graph the image.

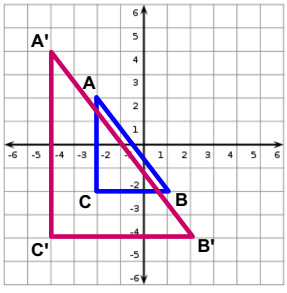
Multiply the coordinates of each point by a scale factor of 2.

$A(-2,2) \rightarrow A'(-4,4)$

$B(1,-2) \rightarrow B'(2,-4)$

$C(-2,-2) \rightarrow C'(-4,-4)$

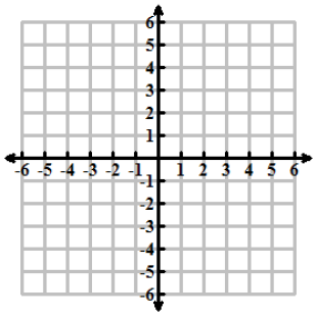
Graph the image.



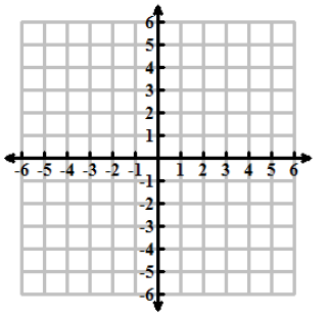
Day 3: L3-N Practice Problems:

Triangle RST has the coordinates R(3, −2), S(2, −1) and T(1, −3). For each transformation below, graph the resulting image and give the coordinates of the vertices of the image.

1. Reflection over the *x*-axis.



2. Translation of 2 units left and 4 units up.

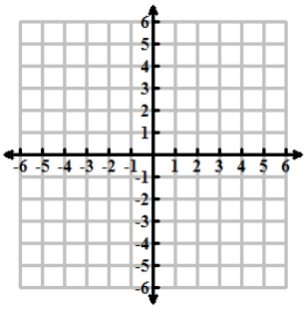


End Day 3

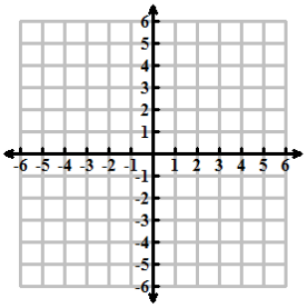
Day 4: L3-N Practice Problems:

Triangle RST has the coordinates R(3, −2), S(2, −1) and T(1, −3). For each transformation below, graph the resulting image and give the coordinates of the vertices of the image.

3. Dilation with a scale factor of 2.



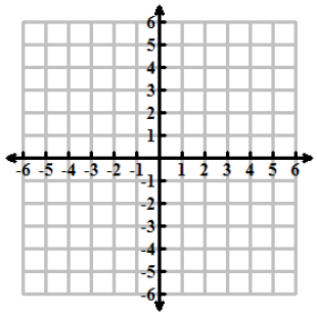
4. Rotation of 180° clockwise about the origin.



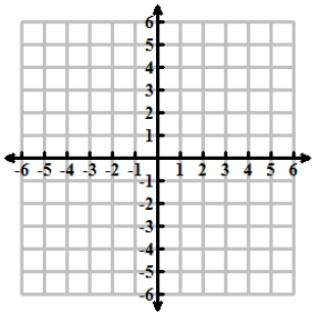
Day 4: L3-N Practice Problems:

Square MNPG has the coordinates M(−2, 1), N(−2, −2), P(1, −2) and G(1, 1). For each transformation below, graph the resulting image and give the coordinates of the vertices of the image.

5. Dilation with a scale factor of 3.



6. Reflection over the *y*-axis.

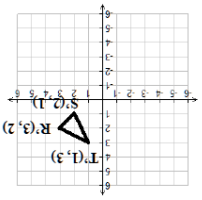


End Day 4

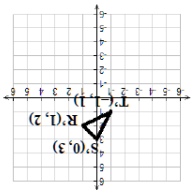
Answer Page #1

Day 3:

1.



2.



Day 2:

5. $r = 7\ m$
6. $d = 24\ in$
7. $r \approx 4\ in$
8. $d \approx 4\ ft$

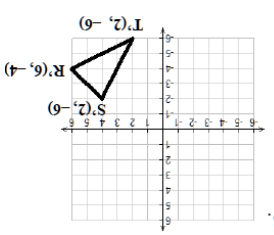
Day 1:

1. $4{,}186.67\ m^3$
2. $3{,}052.08\ cm^3$
3. $904.32\ in^3$
4. $65{,}416.67\ mm^3$

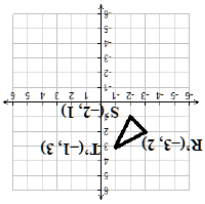
Answer Page #2

Day 4:

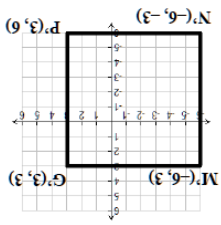
3.



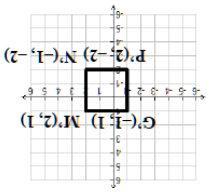
4.



5.



6.



MATH 8: FINAL SLIDE for this week!