

# Geometry Unit 8: Year-to-date Regents review

Bronx Early College Academy

Christopher J. Huson PhD

13 February 2023 - 17 February 2023

8.1 Triangle angles	13 February
8.2 Transversals and isosceles triangles	14 February
8.3 Midpoint, segment partition	16 February
8.4 Area, volume, density, solids	27 February
8.5 Analytic geometry graphing	3 March
8.6 Analytic geometry slope applications	6 March
8.7 Analytic geometry distance applications	7 March

# Learning Target: I can calculate triangle angles

HSG.CO.A.5 Congruence transformations

8.1 Monday 13 February

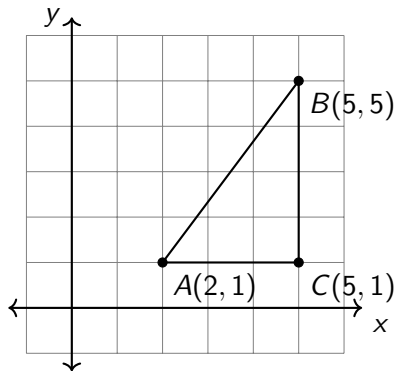
Do Now

1. Review your Jumprope grades
2. Right  $\triangle ABC$  with  $m\angle A = 53^\circ$ . Find  $m\angle B$

Lesson: Internal and external triangle angle measures

Homework: Complete the classwork practice,

Deltamath problem set



# Triangle angle theorems, internal and external angle measures

Find this information in your notebook ( October 24th)

**Triangle sum theorem**  $m\angle A + m\angle B + m\angle C = 180^\circ$

**External angle theorem**  $m\angle A + m\angle B = m\angle BCD$

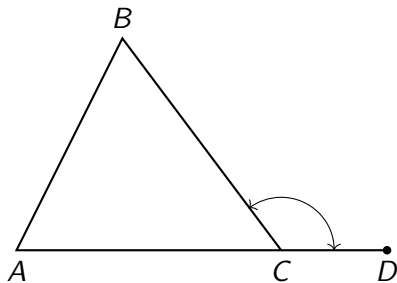
**Linear pair** angles that make a straight line,  $180^\circ$

**Supplementary** angles that sum to  $180^\circ$

**Complementary** angles that sum to  $90^\circ$

**Interior** Inside, internal

**Exterior** Outside, external



## Learning Target: I can work with parallel lines

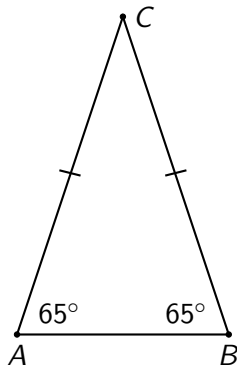
HSG.CO.A.5 Congruence transformations

8.2 Tuesday 14 February

Do Now: Isosceles  $\triangle ABC$  has two angles measuring  $65^\circ$ .  
Find the measure of the 3rd angle,  $m\angle C$ .

Lesson: Isosceles triangles, parallel lines and transversals

Homework: Complete classwork, Deltamath assignment



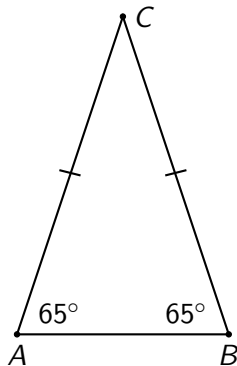
## Isosceles base theorem: Sides $\cong$ *iff* angles $\cong$

Isosceles  $\triangle ABC$  has two angles measuring  $65^\circ$ . Find the measure of the 3rd angle,  $m\angle C$ .

$$65^\circ + 65^\circ + x = 180^\circ$$

$$130^\circ + x = 90^\circ$$

$$x = 30^\circ$$



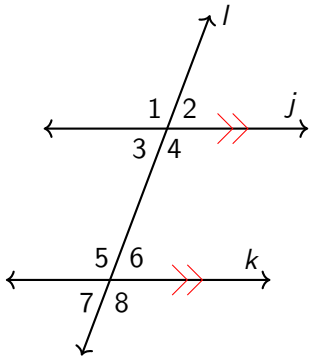
## Two parallel lines and a transversal intersecting them

**Vertical angles** at intersections, opposite angles are  $\cong$

**Corresponding angles** are congruent ( $\angle 2 \cong \angle 6$ )

**Alternate interior** angles inside parallels, not on the same side, are congruent ( $\angle 3 \cong \angle 6$ )

**Same side exterior** angles outside the transversal, on the same side, are supplementary ( $m\angle 1 + m\angle 7 = 180^\circ$ )



# Learning Target: I can partition a line segment

HSG.CO.A.5 Congruence transformations

8.3 Thursday 16 February

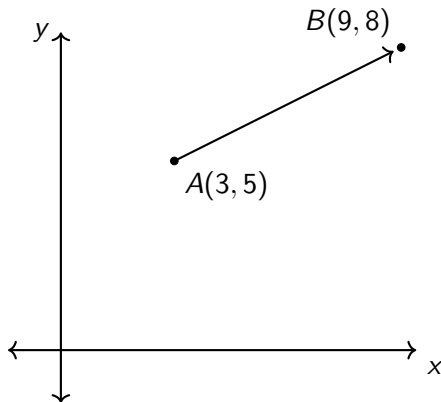
Do Now:

Given  $T_{+a,+b}$  maps  $(3, 5) \rightarrow (9, 8)$

Find  $a$  and  $b$

Lesson: Ratios, partitioning a line segment

Homework: Complete classwork, Deltamath assignment





## Learning Target: I can calculate area and volume

HSG.CO.A.5 Congruence transformations

8.4 Monday 27 February

Do Now: Find the volume of the box with dimensions:

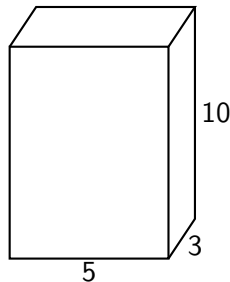
length = 5 cm

width = 3 cm

height = 10 cm

Lesson: Area, perimeter, volume, density, solids, cross sections

Homework: Complete classwork, Deltamath assignment

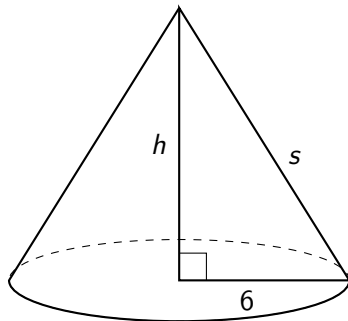


## Use the Regents formula sheet or your notebook for formulas

$$V_{\text{cone}} = \frac{1}{3}\pi r^2 h$$

Given a cone with radius  $r = 6$  inches,  
volume  $V = 96\pi$  cubic inches, and density  
 $D = 0.0267$  pounds per cubic inch

1. Solve for the height  $h$  of the cone
2. Find the *slant height*  $s$  using  
 $a^2 + b^2 = c^2$
3. Find the cone's weight  $W$  to the  
*nearest pound*

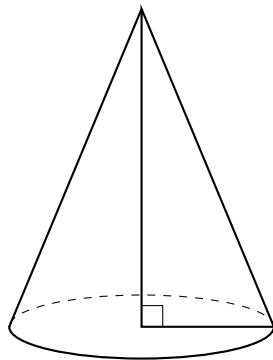


**slant height** The diagonal length of the side of a cone or pyramid

## The study of 3-dimensional shapes are called solid geometry

What 3-dimensional shape is made when a right triangle is rotated around its longer edge?

**cross section** the shape made by a plane intersecting a solid



# Learning Target: I can graph linear equations and systems

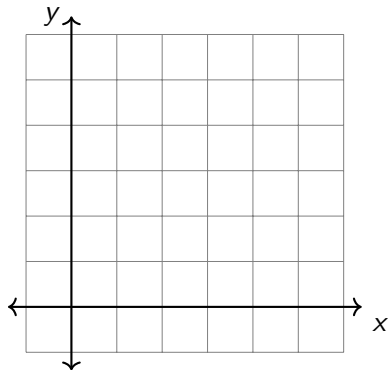
HSA.REI.C.6 Solve systems of linear equations

8.5 Friday 3 March

Do Now: Graph the line  $y = \frac{1}{2}x + 2$

Lesson: slope-intercept form, systems

Homework: Complete classwork, Deltamath assignment



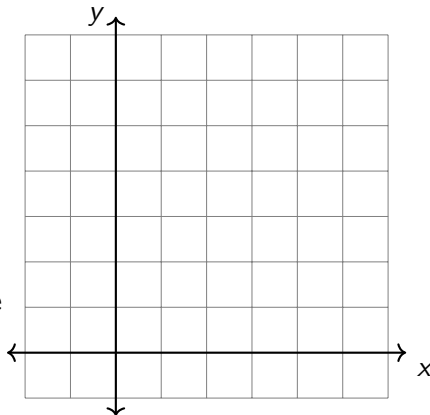
## Solving a system using a graphing calculator

$$f(x) = -\frac{1}{2}x + 6$$

$$g(x) = \frac{3}{4}x + 1$$

**system** two or more equations with the same variables

**intersection** the point where two lines cross, or the  $(x, y)$  values that satisfy both equations



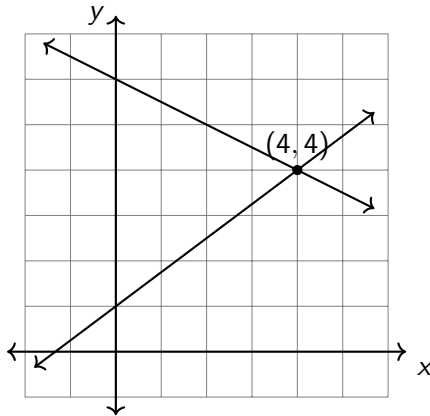
## Solving a system using a graphing calculator

$$f(x) = -\frac{1}{2}x + 6$$

$$g(x) = \frac{3}{4}x + 1$$

$$f(4) = -\frac{1}{2}(4) + 6 = -2 + 6 = 4$$

$$g(4) = \frac{3}{4}(4) + 1 = 3 + 1 = 4$$



# Learning Target: I can use slope to solve problems

HSG.CO.A.5 Congruence transformations

8.6 Monday 6 March

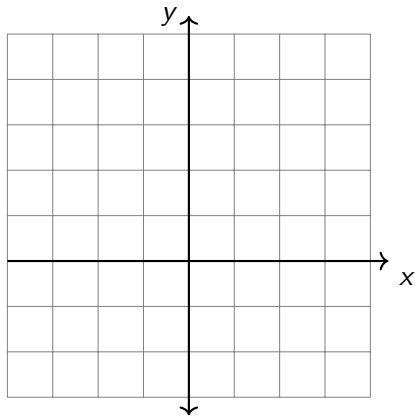
Do Now: Solve the system in your graphing calculator:

$$f(x) = -x + 2$$

$$g(x) = -3x - 2$$

Lesson: Perpendicular and parallel slopes, applications

Homework: Complete classwork, Deltamath assignment



# Learning Target: I can use slope to solve problems

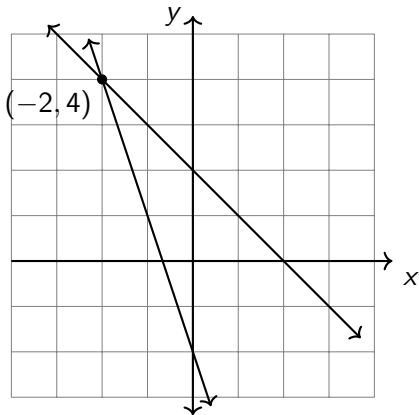
HSG.CO.A.5 Congruence transformations

8.6 Monday 6 March

Do Now: Solve the system in your graphing calculator:

$$f(x) = -x + 2$$

$$g(x) = -3x - 2$$

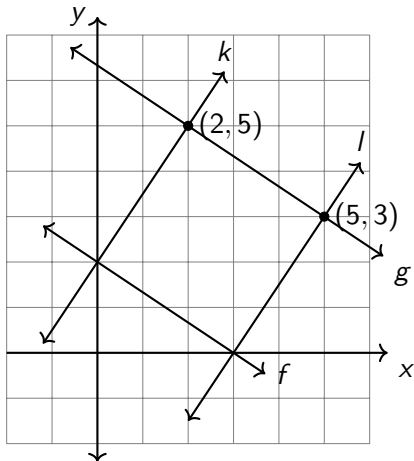




## Use slopes to prove special polygons

Find each line's equation and their relationships

1. Find the equation of line  $f$
2. Find the equation of line  $k$
3. Show that  $f \perp k$  because  $m_f \times m_k = -1$
4. Find and label the slopes of  $g$  and  $l$
5. Show the polygon is a rectangle



# Learning Target: I can calculate distance in context

HSG.CO.A.5 Congruence transformations

8.7 Tuesday 7 March

Do Now: Find the distance between the intercepts of the line show on the graph

Lesson: Distance formula, applications, simplifying radicals

Homework: Complete classwork, Deltamath assignment

