<u>SEMESTER 2 FINALS REVIEW – EXTRA CREDIT</u>

You may earn up to <u>7 points</u> of extra credit by completing the study sheets for each of the chapters that we have covered in first semester. (1 point per page [0.5 points per each ½ page], and if all are completed an extra 0.5 points will be awarded).

The study sheet will be due the day of the final. NO LATE WORK WILL BE ACCEPTED (You may turn it in earlier, however).

The study sheets will be graded using the following criteria:

- full credit per ½ page if everything is filled out, it is organized, and easy to read
- ½ credit per ½ page if most of the information is filled out, but some is missing and/or it is unorganized and not easy to read and follow
- 0 points per ½ page if much of the information is missing and the information is not easy to read and not organized.

If you have questions about this extra credit opportunity, please ask BEFORE you attempt to do it and BEFORE it is due.

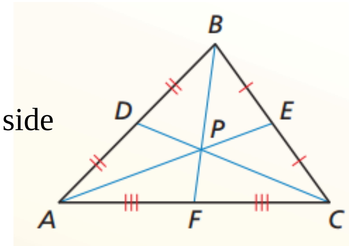
Points: ______________ / 7

CHAPTER 6: RELATIONSHIPS WITHIN TRIANGLES

Section 3: Medians and Altitudes of Triangles

Median: s segment whose endpoints are a ____________________ and the _________________ of the opposite side

_______________________: where the ______________________ of the triangle intersect.

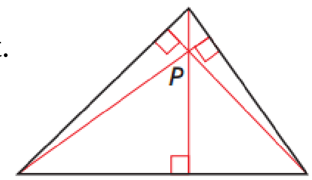


**located ______ of the way from the vertex to the _____________ of the opposite side

**When is this point inside/outside/on the triangle?

Altitude: the ______ segment from a ________________ to its opposite side (or the line containing the opposite side)

_____________________: where the _____________________ of the _________ intersect.



**Where is this point always located? Inside, outside, or on the triangle?:

Section 5: Indirect Proof and Inequalities in One Triangle

List the 4 steps to writing an indirect proof that we discussed in class (they're in your lesson objectives!)

1.

2.

3.

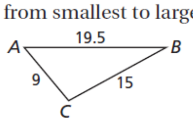
4.

In a triangle, the longer side is always across from the _______________________.

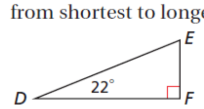
In a triangle, the smaller angle is always across from the _______________________.

Complete the following examples:

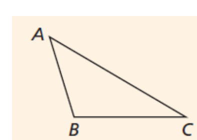
Write the angles in order from smallest to largest.



Write the sides in order from shortest to longest.



Triangle Inequality Theorem: The _______ of any two lengths of a triangle must be **greater than** __________.



Use the triangle to complete the inequality statements:
___ + ___ > ___ and ___ + ___ > ___ and ___ + ___ > ___

Example: Can a triangle with side lengths 4, 9, and 10 be formed? Why or why not?

Section 6: Inequalities in Two Triangles

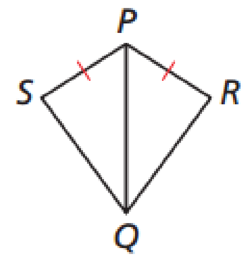
Hinge Theorem: If two sides of one Δ are congruent to two sides of another Δ, and the included angle of the first Δ is larger than the included angle of the second Δ, then the third side of the first Δ is ________________________ the third side of the second Δ.

Converse of the Hinge Theorem: If two sides of one Δ are congruent to two sides of another Δ, and the third side of the first Δ is longer than the third side of the second Δ, then the included angle of the first Δ is ____________________ the included angle of the second Δ.

Complete the following examples:

Use the diagram.

1. If $PR = PS$ and $m\angle QPR > m\angle QPS$, which is longer, $\overline{SQ}$ or $\overline{RQ}$?
2. If $PR = PS$ and $RQ < SQ$, which is larger, $\angle RPQ$ or $\angle SPQ$?



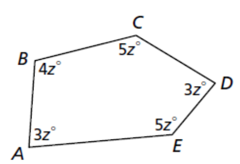
CHAPTER 7: QUADRILATERALS AND OTHER POLYGONS

Section 1: Angles of Polygons

What is the difference between a convex and concave polygon?:

Regular polygon (definition):

Example: solve for z.



Formula for sum of interior angles of a polygon:

Formula for one interior angle of a regular polygon:

Formula for one exterior angle of a regular polygon:

Sum of all exterior angles of any polygon:

Section 2: Properties of Parallelograms

Parallelogram (definition):

Name the 4 properties of a parallelogram:

1.

2.

3.

4.

Section 3: Proving that a Quadrilateral is a Parallelogram

Describe the 5 ways that we can prove a quadrilateral is a parallelogram:

1.
2.
3.
4.
5.

Section 4: Properties of Special Parallelograms

Rectangle (definition):

** A rectangle is also a ________________________. So it has these properties as well.

Name the other 2 properties of a rectangle:

1.
2.

Rhombus (definition):

** A rhombus is also a ________________________. So it has these properties as well.
Name the other 3 properties of a rhombus:

1.
2.
3.

Square (definition):

** A square is also a ________________________ as well as a _________________.So it has ALL of their properties!

To prove that a quadrilateral is a rectangle, first we must show that the quad. is a:

Ways to prove a quad. (after proving it is a ________________) is a rectangle:

1.
2.

To prove that a quadrilateral is a rhombus, first we must show that the quad. is a:

Ways to prove a quad. (after proving it is a ________________) is a rhombus:

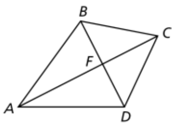
1.
2.
3.

To prove that a quadrilateral is a square, first we must show that the quad. is a:

Then we must show that the _________ is both a ________________ AND a __________________!

Section 5: Properties of Trapezoids and Kites

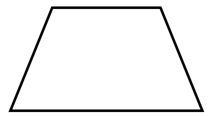
Kite (definition):



Properties: 1) 2)

Trapezoid (definition):

Identify the **base angles** and **legs** of the trapezoid at right:

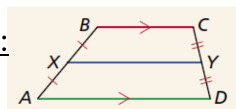


Isosceles Trapezoid:

Properties of an Isosceles Trapezoid:

1. 2. 3.

Trapezoid Midsegment Theorem:



CHAPTER 8: SIMILARITY

Section 1: Similar Polygons

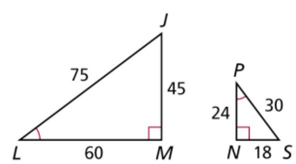
Similar Polygons (def):

What is the symbol for similarity?

How do we find the similarity ratio?

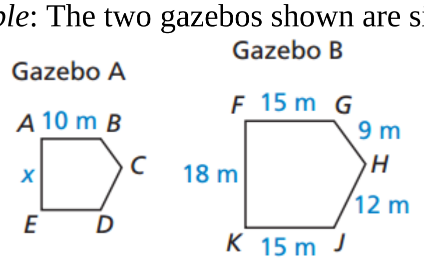
Example: Finish the similarity statement for the 2 triangles: ΔLMJ ~ Δ ___________

Then find the similarity ratio:



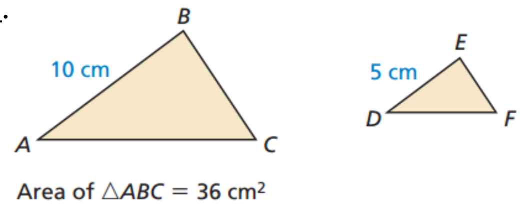
Theorem 8.1 - Perimeters of Similar Polygons: If two polygons are similar, then the ratio of their perimeters is equal to the _______________________.

Example: The two gazebos shown are similar pentagons. Find the perimeter of Gazebo A.



Theorem 8.2: Areas of Similar Polygons: If two polygons are similar, then the ratio of their areas is equal to the ___________________ of the _________________________.

Example: In the diagram, $\Delta ABC \sim \Delta DEF$. Find the area of ΔDEF.



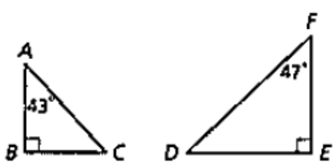
Sections 2 and 3: Proving Triangle Similarity by Angle-Angle, Side-Side-Side, and Side-Angle-Side

What are the three triangle similarity shortcuts? List out their abbreviations below (they are named above ☺)

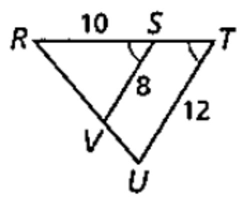
1. 2. 3.

Example: Determine whether the triangles below are similar or not. If so, list the reason and why they are similar and find the similarity ratio.

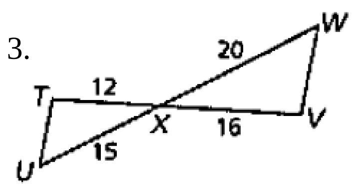
1.



2.



3.



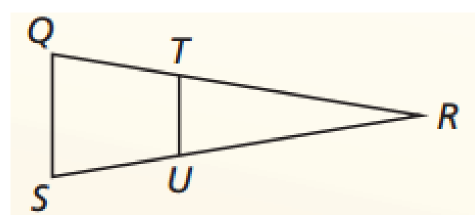
Section 4: Proportionality Theorems

Triangle Proportionality Theorem: If a line parallel to one side of a triangle intersects the other two sides, then it divides the two sides proportionally.

Use the diagram to write the theorem using its segments:

Converse of the Triangle Proportionality Theorem: If a line divides two sides of a triangle proportionally, then it is parallel to the third side.

Use the diagram to write the theorem using its segments:



Inverse of the Triangle Proportionality Theorem:

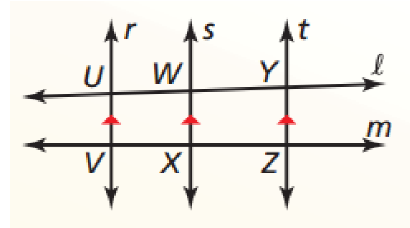
Use the diagram to write the theorem using its segments:

Contrapositive of the Triangle Proportionality Theorem:

Use the diagram to write the theorem using its segments:

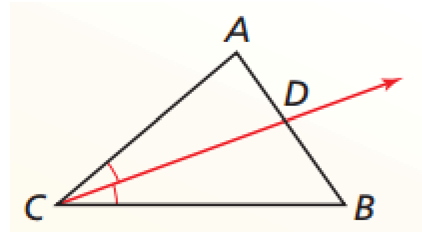
Three Parallel Lines Theorem: If three parallel lines intersect two transversals, then they divide the transversals proportionally

Use the diagram to write the theorem using its segments:



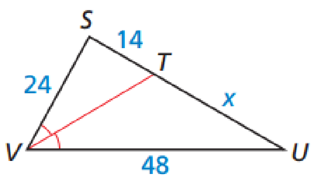
Triangle Angle Bisector Theorem: If a ray bisects an angle of a triangle, then it divides the opposite side into segments whose lengths are proportional to the lengths of the other two sides.

Use the diagram to write the theorem using its segments:

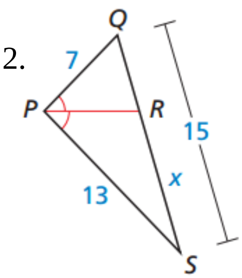


Examples: Find the value of x in the following diagrams:

1.



2.



CHAPTER 9: RIGHT TRIANGLES AND TRIGONOMETRY

Section 1: The Pythagorean Theorem

The Pythagorean Theorem: If ______________________, then ____________________.

What is a Pythagorean Triple?:

What are the 4 examples of Pythagorean Triples that we discussed in class?:

1. 2. 3. 4.

Converse of the Pythagorean Theorem: If ______________________, then ____________________.

Pythagorean Inequalities Theorem:

1. If $a^2 + b^2 > c^2$, then the triangle is ___________________.
2. If $a^2 + b^2 < c^2$, then the triangle is ___________________.

**in the two above, c is always the ___________________________ of the three sides of the triangle.

Section 2: Special Right Triangles

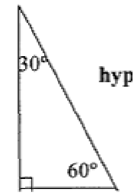
45-45-90 Special Right Triangle: label the short legs and hypotenuse in the triangle art right

Formula: Hypotenuse = (_______________)(_______)

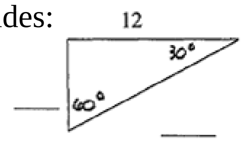
30-60-90 Special Right Triangle: label the short leg, long leg, and hypotenuse in the triangle below:

Formula: Long Leg = (________________)(________)

Formula: Hypotenuse = (________________)(________)

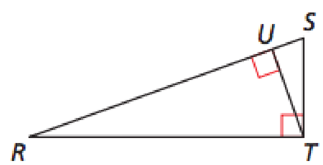


Find the length of the missing sides:



Section 3: Similar Right Triangles

Example: Write the triangle similarity statement for the triangles:



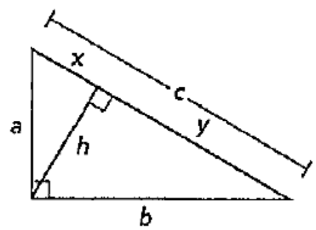
The __________________________ of two numbers is the positive square root of their product.

Finish the equations using the triangle below, then use the equations to solve for x, y, and z in the example:

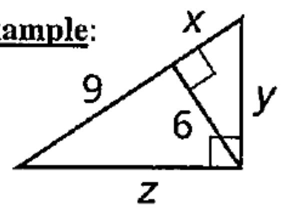
$h^2 =$

$a^2 =$

$b^2 =$



Example:

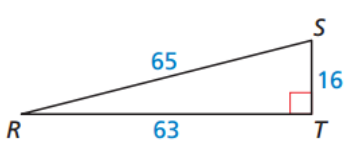


Sections 4 and 5: The Sine, Cosine, and Tangent Ratios

Use the "SOH-CAH-TOA" acronym to write the side ratios for the following trig ratios:

$\sin\theta =$ $\cos\theta =$ $\tan\theta =$

Use the triangle below to find the following trig ratios:

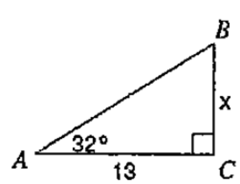


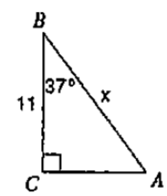
$\sin S =$

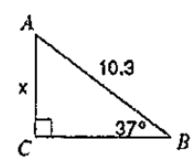
$\cos S =$

$\tan S =$

Set up the trig ratio equations that you would use to solve for x below (do not solve):







An angle of elevation is an angle formed by a horizontal line of sight and the line of sight (upwards/downwards – circle one)

An angle of depression is an angle formed by a horizontal line of sight and the line of sight(upwards/downwards – circle one)

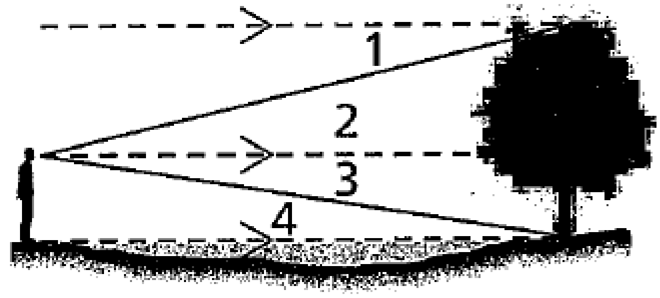
Example: Classify each angle in the diagram as an angle of elevation or depression

Angle 1:

Angle 2:

Angle 3:

Angle 4:

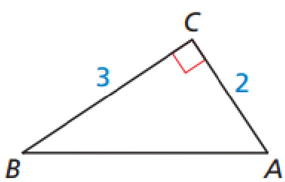


Section 6: Solving Right Triangles

We use inverse trig ratios to solve for ____________________ in right triangles.

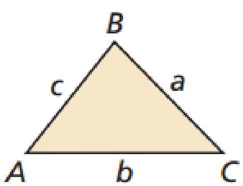
What symbol do we use to denote the inverse trigonometric ratios? Give an example here: ________________

Example: Set up the equation that you would use to solve for angle A below (do not solve)



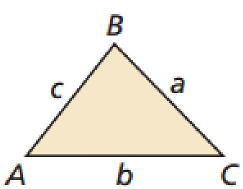
Section 7: Law of Sines and Law of Cosines

Use the triangle below to write the Law of Sines:



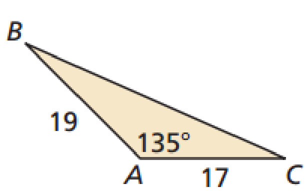
We can use the Law of Sines when we are given the following case(s): _____________________________________

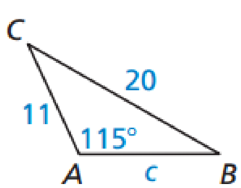
Use the triangle below to write the Law of Cosines:

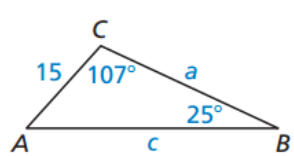


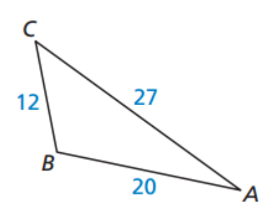
We can use the Law of Cosines when we are given the following case(s): ___________________________________

Example: Determine whether each triangle below would use the Law of Sines or the Law of Cosines, then set up the equation that you would use to solve the triangle.





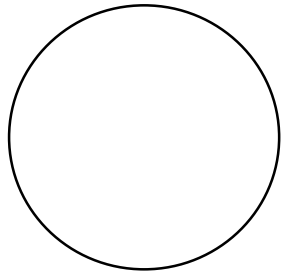




CHAPTER 10: CIRCLES

Section 1: Lines and Segments that Intersect Circles

Draw examples of each vocab term in the circle below: chord, secant, tangent, point of tangency, radius, diameter

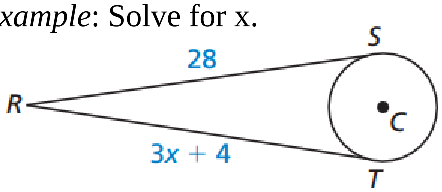


What are concentric circles? Describe in words, then draw an example.

What are tangent circles? Describe in words, then draw an example.

The tangent line is always ____________________________ to the radius at the __________________________________.

Example: Solve for x.



Sections 2 and 3: Finding Arc Measures and Using Chords

A _______________________________________ is an angle whose vertex is at the center of the circle.

What is the difference between a major arc and a minor arc? Use their degree measures to describe.

Theorems: In a circle (or congruent circles), then…

1. If central angles are ________ → chords __________
2. If chords __________ → intercepted arcs ____________
3. If arcs _________ → central angles __________

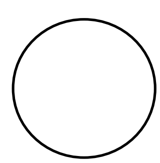
Theorem: In a circle, if a radius (or diameter) is ______ to a chord, then it bisects the chord and the intercepted arc.

Theorem: In a circle, the ____ of a chord is a radius (or diameter)

Theorem: In a circle, two chords are congruent if and only if they are _________________________ from the center.

Section 4: Inscribed Angles and Polygons

What is an inscribed angle? Describe in words, then draw an example in the circle:



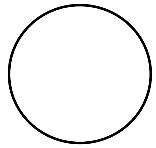
What is the measure of an inscribed angle compared to its intercepted arc measure?

Inscribed angles that have the same intercepted arc are always ____________.

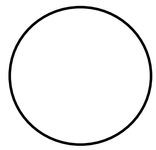
If the inscribed angle's intercepted arc is a semicircle, then its measure is always __________________.

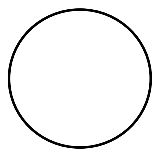
If a quadrilateral's vertices are in a circle, then opposite angles are always ___________________________.

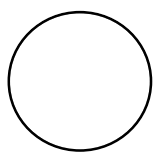
Section 5: Angle Relationships in Circles

Draw an example of an angle formed by a tangent and a chord: 

Refer to Theorem 10.14 on page 562. What is the formula to find this angle measure?

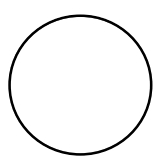
Draw an example of an angle formed by a tangent and a secant: 

Draw an example of an angle formed by two secants: 

Draw an example of an angle formed by two tangents: 

Which of the above drawings describes a circumscribed angle?

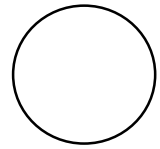
Refer to Theorem 10.16 on page 563. What was the general formula we came up with in class to describe how to find the angle measure outside the circle?

Draw an example of two chords intersecting inside the circle 

Refer to Theorem 10.15 on page 563. Write the formula to finding one of the angle measures you drew above, formed by the intersecting chords:

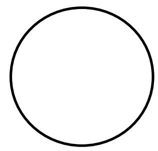
Section 6: Segment Relationships in Circles

Draw an example of two chords intersecting inside the circle.



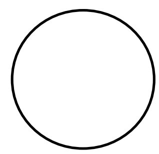
What is the formula for finding the length of each segment of the chord?

Draw an example of an angle formed by two secants:



What was the formula we came up with in class for finding the length of each secant segment?

Draw an example of an angle formed by a tangent and a secant:



What was the formula we came up with in class for finding the length of each segment?

Section 7: Circles in the Coordinate Plane

What is the equation for a circle in the coordinate plane?

Where is the center located?

CHAPTER 11: CIRCUMFERENCE, AREA, AND VOLUME

Section 1: Circumference and Arc Length

What is the formula for the circumference of a circle?

What is the arc length (definition)? Write the formula to find the arc length in a circle:

Converting radians to degrees, we use the unit conversion:

Converting degrees to radians, we use the unit conversion:

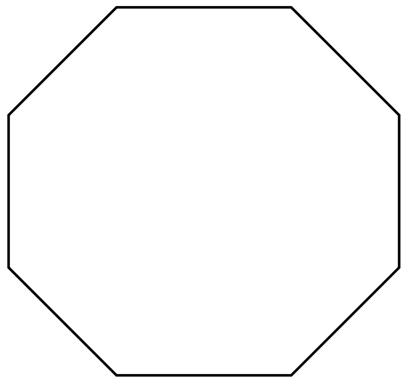
Section 2: Areas of Circles and Sectors

What is the formula for the area of a circle?

What is the sector of a circle (definition)? Write the formula to find the area of the sector of a circle:

<u>Section 3: Areas of Polygons</u>

In the regular polygon below, draw in where each of the following would be: apothem, radius, central angle



How do we find the measure of the central angle in a regular polygon?

What is the formula for finding the area of a regular polygon?

Example: Find the area of a regular decagon with an apothem of 4 units.

What is the formula for finding the area of a kite or rhombus?

<u>Section 4: 3D Figures</u>

Define the parts of a solid:

Face:

Edge:

Vertex:

How many bases do prisms/cylinders have? How do we classify what shape the base is in a solid?

How many bases do pyramids/cones have?

Section 5: Volumes of Prisms and Cylinders (including Surface Area)

What is the formula for finding the volume of a prism or cylinder?

What is a net for a solid?

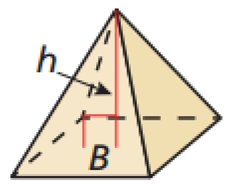
What is the formula for finding the lateral area of a prism or cylinder?

What is the formula for finding the surface area of a prism or cylinder?

Sections 6 and 7: Volumes of Pyramids and Cones

What is the formula for finding the volume of a pyamid or cone?

What is the slant height of a cone or pyramid? Draw an example on the diagram:



What is the formula for finding the lateral area of a cone or pyramid?

What is the formula for finding the surface area of a cone or pyramid?

Section 8: Surface Areas and Volumes of Spheres

What is the formula for finding the surface area of a sphere?

What is the formula for finding the volume of a sphere?