FINAL EXAM REVIEW:GEOMETRY SEMESTER 2

PART 1: OVERVIEW

The entire final exam will be multiple choice, but it will not be divided into sections like this study guide is.

MUST be memorized	Do NOT need to be memorized
Conversion factors • Metric system conversions • Conversion factors for length • Conversion factors for time	Conversion factors for volume (i.e. quarts, pints)
Right triangles • Trigonometry ratios (Soh-Cah-Toa) • Pythagorean Theorem	3D solids • Volume formulas • Surface area formulas
Circle formulas • Equation of a circle • Area • Circumference • Arc length formula	
Area of basic shapes • Rectangle • Triangle • Circle • Regular polygons	

CONCEPT OVERVIEW

Unit	Concept(s) & Vocabulary	Book page #s
7: Ratios and Proportions	• Completing unit conversions • Setting up and solving proportions in real-world problems	None
8: Similarity	• How to tell if figures are similar, congruent, or neither • Calculating missing values in similar figures	p. 358, 375, 382
9: Right Triangles	• Rules for simplifying radicals • Using Pythagorean Theorem and Trigonometric ratios to find missing values	p. 427, 435, 451-477
10: Circles	• Equations of circles • Area and circumference • Using properties of tangent lines • Calculating arc measure and arc length	p. 641, 649, 710, 719
11: 2D Area	• How to find the area of a composite shapes and quadrilaterals by breaking into smaller pieces • Calculating the area of regular polygons	p. 501, 726 *Reference p. 509 – 549 if you want to explore a different way to find area of quadrilaterals*
12: 3D Shapes	• Naming 3D solids • How to use formulas to find volume and surface area • Determining the shape of cross-sections from 3D figures	p. 742, 751, 763, 774

PART 2: PRACTICE PROBLEMS Highlight all ?s that you get stuck on and ask for help.

UNIT 7: RATIOS AND PROPORTIONS

1. A student made a small model of a playground slide. The slide in the model was 3.75 feet high and 0.5 feet wide. In the actual playground, the slide is 2 feet wide. Which proportion correctly shows how to find the height of the slide?

A $\frac{3.75}{0.5} = \frac{2}{x}$ C $\frac{3.75}{0.5} = \frac{x}{2}$

B $\frac{3.75}{2} = \frac{0.5}{x}$ D $\frac{x}{0.5} = \frac{2}{3.75}$

2. If the exchange rate of Canadian dollars to American dollars is 1 to 0.85 and a pair of running shoes cost $86 in American dollars, then what would its price be in Canadian dollars?

   a. $73.10   c. $101.18
   b. $573.33   d. $12.90

3. The Packers football team is on a **winning** streak. They have won 13 out of their 15 regular season games. What is their wins to losses ratio?

   a. 13:15   c. 15:13
   b. 13:2   d. 2:13

4. The measures of supplementary angles are in the ratio 9:3. Find the measure of the **smaller** angle.

   c. 15   c. 12
   d. 135   d. 45

5. Michael wants to build a treehouse. The ratio between his blueprint measurements and the actual treehouse measurements are 6 in : 1.5 ft. On the blueprints, the treehouse is 8 inches wide and 13 inches tall. How tall is the actual treehouse (in feet)?

   e. 3.25 ft   d. 2 ft
   f. 1.08 ft   e. 78 ft

6. The scale on a map is 2.5 cm : 140 m. If the distance between the school and the grocery store on the map is 17.5 centimeters, what is the actual distance between the buildings?

   a. 980 m   c. 17.5 m
   b. 0.31 m   d. 1,190 m

7. The measures of complementary angles are in the ratio 2:7. Find the measure of the **larger** angle.

   g. 90   c. 10
   h. 20   d. 70

8. Convert 120 pints to gallons (ok to look up conversions)	9. How many meters are in 42 kilometers?
10. Convert 127,000 mm to m	11. Calculate the number of gallons in 15 cups of milk (ok to look up conversions)
12. Convert 520 $^{m}/_{min}$ into $^{mm}/_{sec}$	

13. Convert 64 mi/hr into ft/sec

14. Convert 9 m/sec into ft/min

15. As of February 2013, the exchange rate between The Euro (European Money) and American Dollar is 1: 1.33. If a pair of running shoes costs $75 in the US, how much does it cost in Europe?

16. The ratio of the angle measures of a triangle is 2 : 3 : 7. What are the measures of the angles?

17. A basketball player can make 20 free throws in 2 minutes. How many free throws can he make in 4.5 hours?

18. Farrakhan can run ½ of a mile in 280 seconds. At that same pace, how many minutes will it take Farrakhan to run 3 miles?

UNIT 8: SIMILARITY

1. If two polygons are SIMILAR, then the corresponding **sides** must be _____.

2. If two polygons are SIMILAR, then the corresponding **angles** must be _____.

3. Which similarity statement is true for the triangles shown?
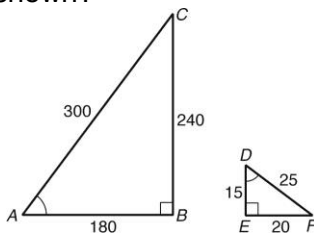
a. $\triangle ABC \sim \triangle FDE$ c. $\triangle ABC \sim \triangle FED$
b. $\triangle ABC \sim \triangle DFE$ d. $\triangle ABC \sim \triangle DEF$

4. Using the similarity statement and the picture below, determine the length of MO *(round to nearest hundredth)*
$\triangle JKL \sim \triangle MNO.$

a. 11.67 u
b. 8.57 u
c. 16.8 u
d. 5.71 u
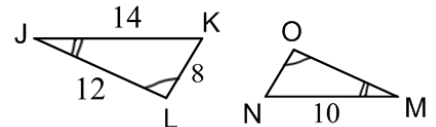
5. △*JKL* ~ △*MNO*. If MO = 10, what is the length of $\overline{MN}$?
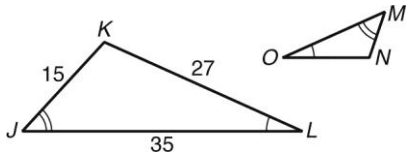
    a. 52.5   c. 7.71
    b. 4.29   d. 10

6. Which picture is **NOT** similar to the "Original" picture frame?

Original:

6 in
15 in

a.   2 in   c.
        5 in   18 in

27 in

b.   d.
12 in   9in
30 in   22.5 in
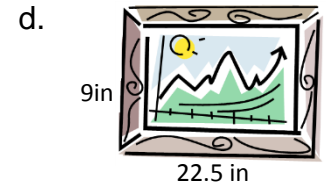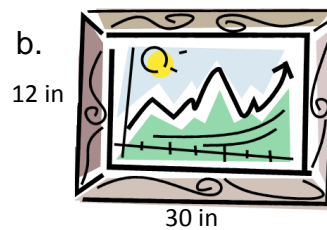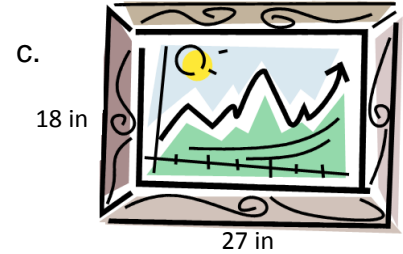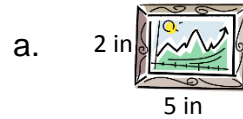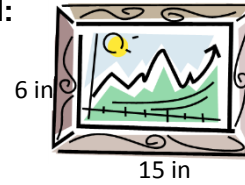
7. Amarri is 71 inches tall and casts a shadow that is 155 inches long. He is standing next to his little brother who is casting a shadow that is 120 inches long. How tall is Amarri's little brother?

8. At 5:30pm, the shadow of a lamppost lines up with the shadow of a flagpole. The lamppost is 15 feet from a rock. The <u>lamppost</u> is also 18 feet from the flagpole. If we know that the lamppost is 9 feet tall, how tall is the flagpole?
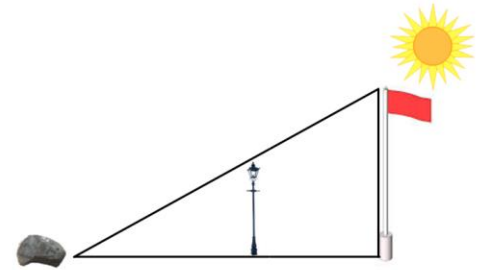
9. Find the values of x and y:
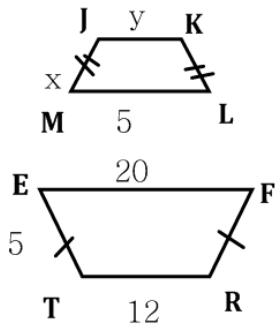
10. Find the values of x, y, and z
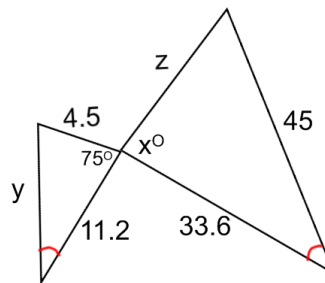
11. Can we prove that these triangles are similar?
    YES / NO / NOT ENOUGH INFO
    Explain your answer.
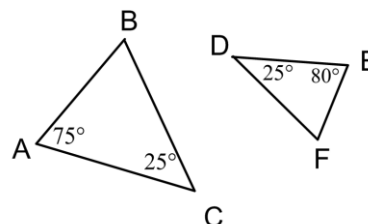
UNIT 9: RIGHT TRIANGLES

Rewrite the expressions in their most simplified, radical form:

1. $2\sqrt{90}$	2. $\frac{18}{\sqrt{8}}$	3. $5\sqrt{3} \cdot 2\sqrt{6}$	4. $\left(3\sqrt{7}\right)^2$	5. $\left(4\sqrt{3}\right)^2$

6. You are given 3 side lengths of a triangle. Which triangle is **NOT** a <u>right</u> triangle?
    a. 7, 24, 25
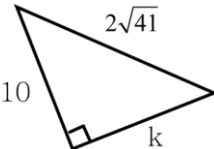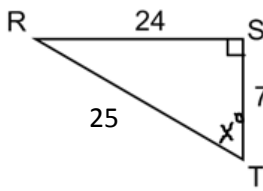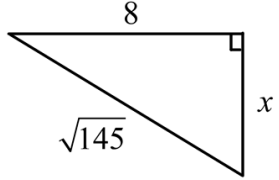   b. 9, 12, 15
    c. 15, 36, 39
    d. 3, 5, 7
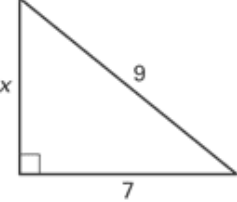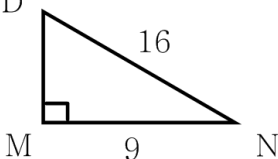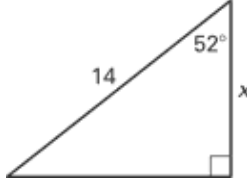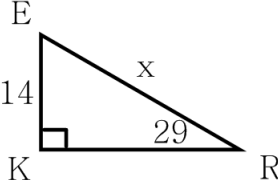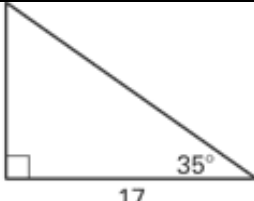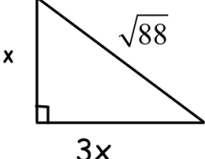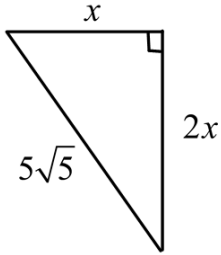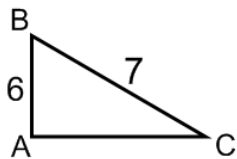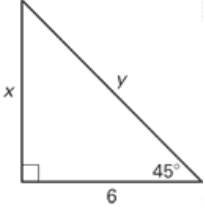
7. Which trigonometric ratio is defined as $\frac{adjacent\ leg}{hypotenuse}$?
    a. Sine
    b. Cosine
    c. Tangent
    d. Opposite leg

Calculate the value of all missing values in these right triangles.

8.	9. m ∠ D= _____	10. A 22 ft ladder is leaning against a house. The ladder is 10 feet from the base. How high up the side of the house does the ladder reach?
11.	12.	13.
14. A 40 foot ladder is leaning against the side of your house. The base of the ladder is 7 feet from the wall. How high up the side of the house does the ladder reach? Round to the nearest hundredth.	15.	16.

17.	18.	19.
R — 24 — S, 7, 25, T, x° (triangle)	8, x, √145 (triangle)	x, 2x, 5√5 (triangle)

20. m ∠ B = _____	21.	22. A flag pole casts a 65-foot shadow when the sun is at a 34° angle with the ground. How tall is the flagpole? Draw it.
B, 6, 7, A, C (triangle)	x, y, 45°, 6 (triangle)	

UNIT 10: CIRCLES

1. Name a center _____

2. Name a radius _____

3. Name a diameter _____

4. Name a pt of tangency _____

5. Name a tangent _____
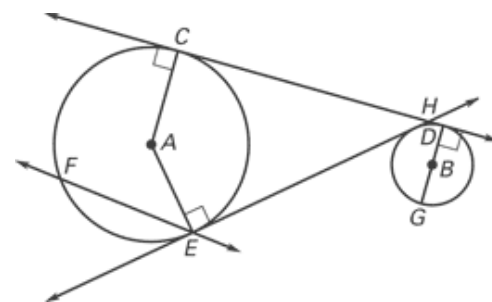
6. Write the equation of a circle with a center of (2,- 7) and a radius of $\sqrt{10}$.

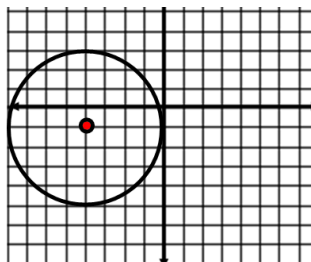8. What is the center of a circle whose equation is $(x - 8)^2 + y^2 = 100$?
   a. (-8, 0)   c. (-8, 10)
   b. (8, 0)   d. (0, -8)

7. What is the radius of a circle whose equation is $(x + 1)^2 + (y - 3)^2 = 80$?

9. Which of the following represents a circle with center (2, -7) and a radius of 7?
   a. $(x + 2)^2 + (y - 7)^2 = 49$
   b. $(x - 2)^2 + (y + 7)^2 = 49$
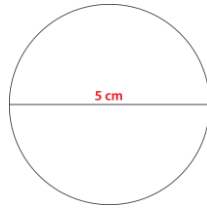   c. $(x + 2)^2 + (y - 7)^2 = 7$
   d. $(x - 2)^2 + (y + 7)^2 = 7$

10. Write the equation of the circle graphed to the right. .

11. Find the <u>exact</u> <u>circumference</u> of the circle if the area of the circle is 64π cm².

12. Find the <u>exact area</u> of a circle if the circumference of the circle is 100π ft².

13. Determine the exact area of the circle to the right.

5 cm

14. Benjamin just installed a water sprinkler in his front yard. It rotates 360 degrees while spraying out water reaching 7 feet from the sprinkler. How much of his lawn does his sprinkler water/cover? Round to nearest whole number.

15. Christopher is a farmer. He wants to make a circular vegetable garden near his farmhouse. He wants to cover his entire garden with dark, rich soil from Alabama. If he is going to buy 90 feet of fence to surround the garden, how much soil will he need in order to cover his entire garden? (ignore the depth of the garden)

16. Jorge and his family have bought a circular, above-ground pool. He wants to string lights around the outside of the pool for the next pool party they will be having. If the diameter of the pool is 9 meters, how long will the string of lights need to be?

17. Circle all statements that are true about tangent lines:
A tangent line touches a circle at ONLY one point   A tangent line can pass through a circle
A tangent line forms a 90° angle with a radius of the circle   A tangent line is congruent to the radius

18. In the diagram, $\overline{RS}$ is a radius of circle R. Prove whether or not $\overline{ST}$ is tangent to circle R? Explain your answer.
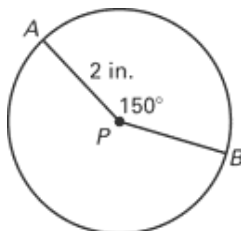
R ────── 13 ────── T
4   12
S
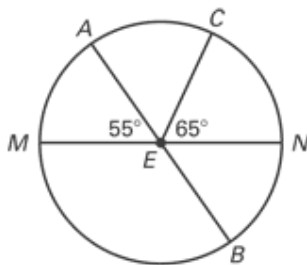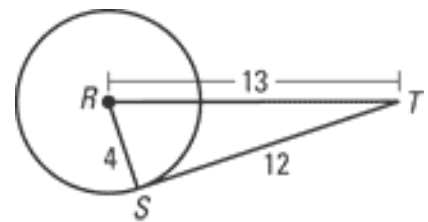
Segment MN and AB are diameters of $\odot E$. Calculate the following arc measures.

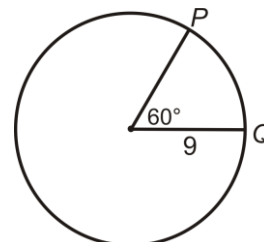M 55° 65° N 19. $m\,\widehat{ACB}$ 21. $m\,\widehat{MBC}$
     E 20. $m\,\widehat{MC}$ 22. $m\angle CEB$

A C B

23. Find the length of $\widehat{AB}$. Round to the nearest tenth.

A
2 in.
150°
P
B

24. Find the length of $\widehat{PQ}$. Round to the nearest tenth.
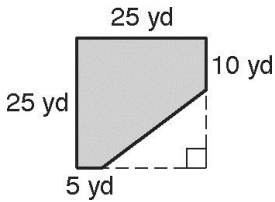
P
60°
9
Q

UNIT 11: 2D AREA

? *What simpler shapes do you see? (i.e. rectangles, circles, triangles)*

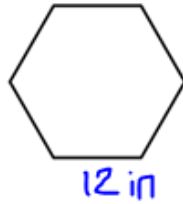**?** *Should I add or subtract the areas of the pieces?*

1. Convert 1,850,000 square feet into sq miles.   2. Convert 200 ft^2 into square inches.

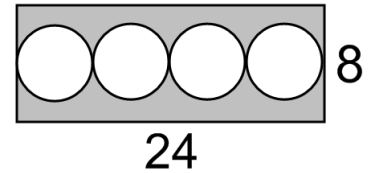Calculate the area of the following shapes:

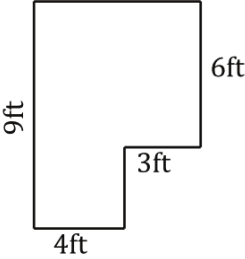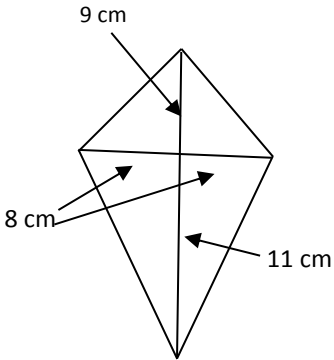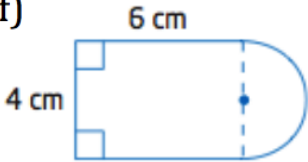|		
3. Find the area of the shaded region. 25 yd 10 yd 25 yd 5 yd	4. Find the area of this regular hexagon 12 in	5. Find the area of the shaded region. 8 24
6. (40 in describes half of the diagonal) 50 in. 40 in	7. A pool, shown below, is surrounded by a cement walkway. The walkway is 3 feet wide. What is the area of **ONLY** the walkway? 7' 18 ft	8. 13 15 9 15
9. 6in 16in 10in 10in	10. Find the area of the shaded region. 14 ft 21 ft	11. 17 17 30 17 17
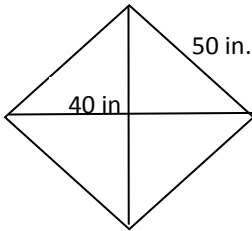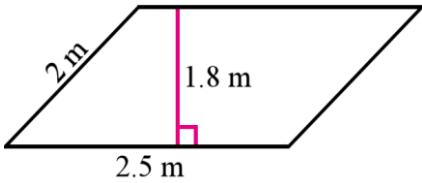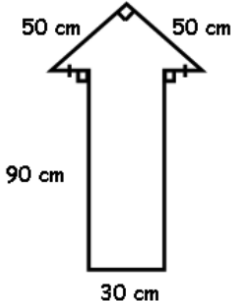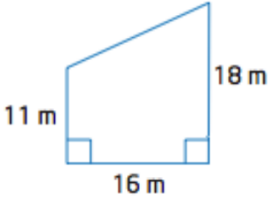
12.

2 m
1.8 m
2.5 m

13.

9ft
6ft
3ft
4ft

14.

9 cm
8 cm
11 cm

f)

6 cm
4 cm

15.

16.

50 cm   50 cm
90 cm
30 cm

17.

18 m
11 m
16 m

18. The length of a rectangle is five times its width. If the perimeter of the rectangle is 84 inches, find its area.

19. The length of a rectangle is three times its width. If the area of the rectangle is 108 m^2, find its perimeter.

20. The perimeter of a rhombus is 40 ft, and the length of one diagonal is 16 ft. Find the length of the other diagonal.

21. The perimeter of a rhombus is 100 inches, and the length of one diagonal is 14 inches. Find the area of the rhombus.

22. An isosceles trapezoid has an area of 92 in^2. If the height is 8 in long and the smaller base is 9 in, what is the length of the other base?
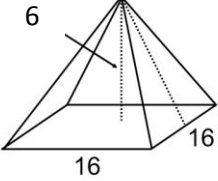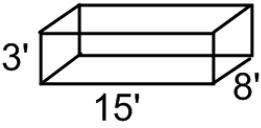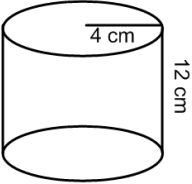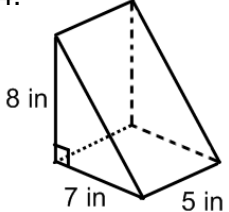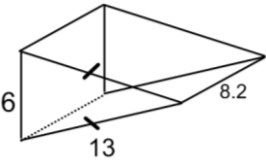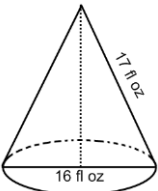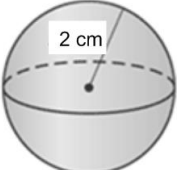
23. An isosceles trapezoid has an area of 90 cm^2. If the height is 12 cm long and the smaller base is 6 cm, what is the length of the other base?
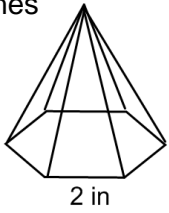
UNIT 12: 3D SHAPES

*You may use your formulas for this section – they do NOT need to be memorized

Fill out the following table for each of the solids:

	Name of shape	Exact volume	Exact surface area	# Faces, Edges, Vertices
1. 6 16 16				
2. 3' 15' 8'				
3. 4 cm 12 cm				N/A
4. 8 in 7 in 5 in				
5. 6 8.2 13				
6. 17 fl oz 16 fl oz				N/A
7. 2 cm				N/A

8. The height is 10 inches 2 in				

9. The plane is cutting the 3D shape. What is the shape of the resulting cross-section?
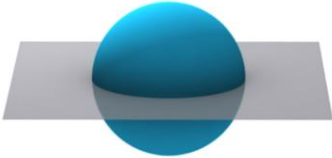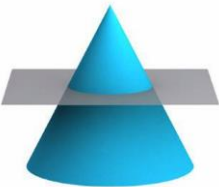
(a) (b) (c) (d)

10. The plane is cutting the 3D shape. What is the shape of the resulting cross-section?

(a) (b) (c) (d)

11. The plane is cutting the 3D shape. What is the shape of the resulting cross-section?
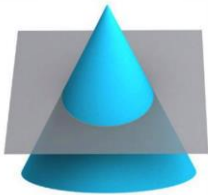
(a) (b) (c) (d)

12. The plane is cutting the 3D shape. What is the shape of the resulting cross-section?

(a) (b) (c) (d)