EOC Rev KEY

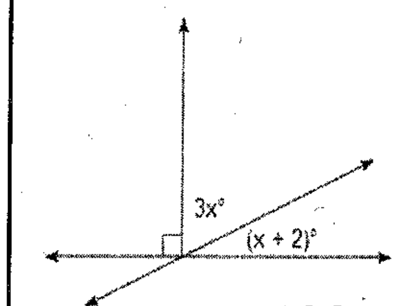
CCGPS Geometry **EOC Review with Notes**

Name: Key Date: ______

Use the following to review for you test. **Show your work on a separate sheet of paper if needed.**

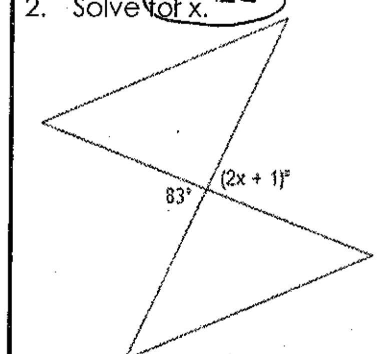
Things to Know	Things to Remember	Examples
Solving for missing angles	Linear Pair – ___ + ___ = 180° Supplementary Angles ___ + ___ = 180° Complementary Angles ___ + ___ = 90° Vertical Angles ___ = ___ For parallel lines: Alternate Interior Angles ___ = ___ Alternate Exterior Angles ___ = ___ Corresponding Angles ___ = ___ Consecutive Interior Angles ___ + ___ = 180°	See examples 1–5 below

1. Solve for x.



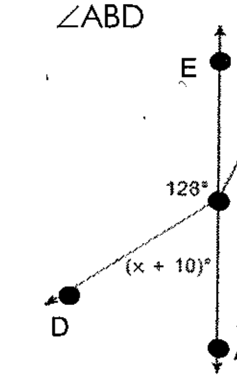
$3x + x + 2 = 90$
$4x + 2 = 90$
$4x = 88$
$x = 22$

2. Solve for x.



$83 = 2x + 1$
$82 = 2x$
$41 = x$

3. Solve for x, and the measure of ∠ABD

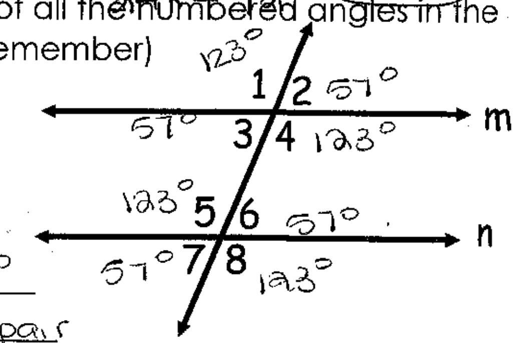


$x + 10 + 128 = 180$
$x = 42$

4. One of two supplementary angles is 98° greater than its supplement. Find the measure of both angles.

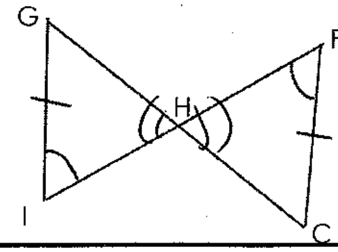
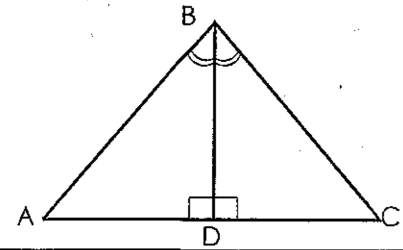
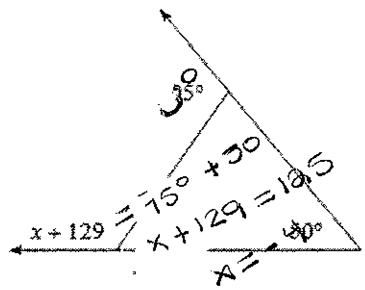
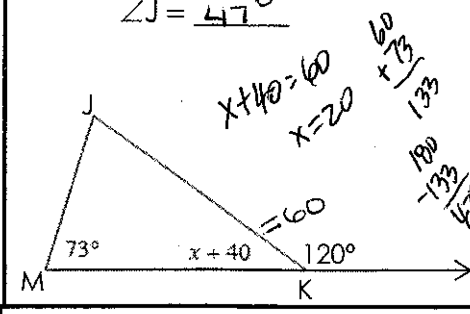
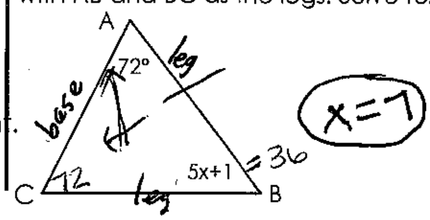
5. ∠1 and ∠2 are complementary angles. Solve for x and the measure of both angles.
$m\angle 1 = 7x + 20 = 41°$
$m\angle 2 = 17x - 2$ 49°
$7x + 20 + 17x - 2 = 90$
$24x + 18 = 90$ $x = 3$
$24x = 72$

6. Given m is parallel to n, $m\angle 8 = 123°$, find the measures of all the numbered angles in the figure, and give the reason why (vocab in things to remember)

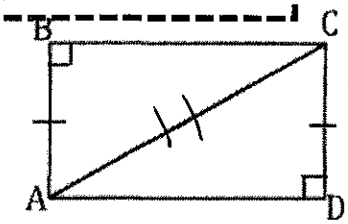


$m\angle 1 =$ 123° alt. exterior, $m\angle 2 =$ 57° same side exterior ∠5, $m\angle 3 =$ 57° vertical ∠5 with ∠2

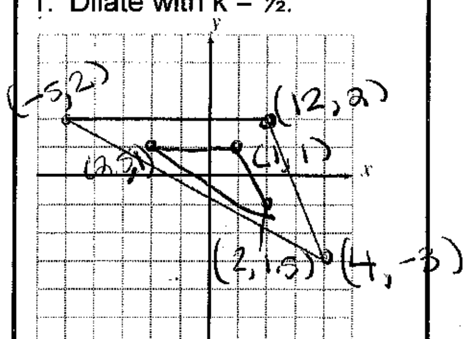
$m\angle 4 =$ 123° corresponding ∠5, $m\angle 5 =$ 123° vertical ∠5, $m\angle 6 =$ 57° linear pair, $m\angle 7 =$ 57° linear pair

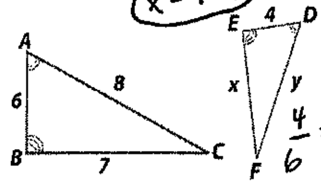
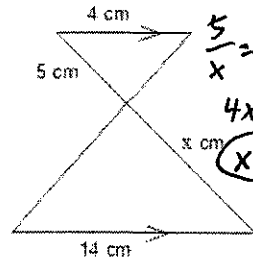
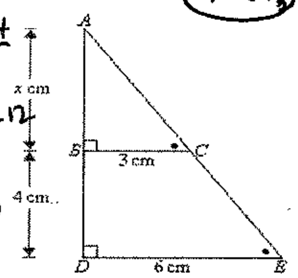
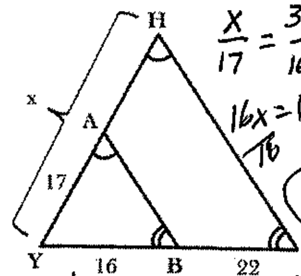
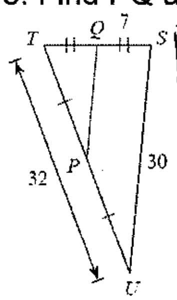
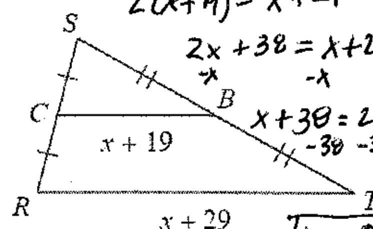
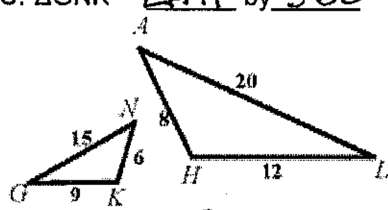
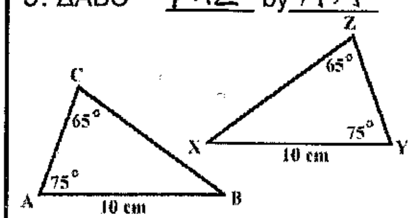
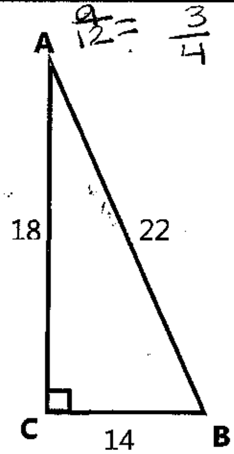
Triangle Congruence	Ways to prove triangles are congruent: SSS, SAS, ASA, AAS, HL	7. $\Delta GHI \cong$ △CHF by AAS 	8. $\Delta ABD \cong$ △CBD, by ASA 
Sum of Interior & Exterior Angles	The sum of all interior angles is 180°. $\angle 1 + \angle 2 + \angle 3 = 180°$ The sum of a straight line is 180°.	9. Solve for x = -4 	10. Solve for x = 20 and $\angle J =$ 47° 
		Isosceles triangles: In an isosceles triangle, the legs are congruent and the base angles are congruent.	11. ΔABC is an isosceles triangle with AB and BC as the legs. Solve for x.  base ∡s are ≅

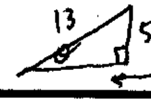
Choice Bank: SSS SAS ASA AAS HL CPCTC Vertical Angles are ≅
Reflexive Property Alternate Interior Angles ≅ Right Angles are ≅
Transitive Property Definition of a Midpoint Given

Proofs	State what is given first, and mark your picture! Step 1 – Write down the givens Step 2 – Make any marks that you know are congruent (reflexive property, vertical angles, alternate interior angles) Step 3 – The last Statement will always be showing the Triangles are ≅ (SSS, SAS, ASA, AAS, HL)	12. Given: $\overline{AB} \cong \overline{DC}$ Prove: $\Delta ABC \cong \Delta CDA$ 

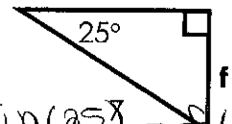
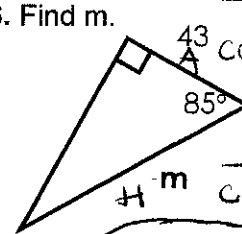
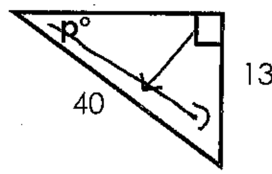
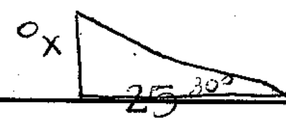
Statements	Reasons
1. $\overline{AB} \cong \overline{DC}$	1. Given
2. $\overline{AC} \cong \overline{AC}$	2. Reflexive
3. $\angle ABC \cong \angle CDA$	3. All right Δs are ≅
4. $\Delta ABC \cong \Delta CDA$	4. HL

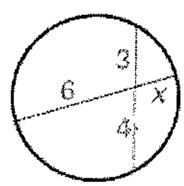
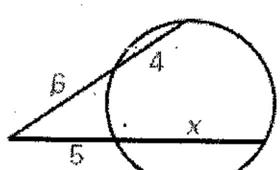
What you need to know & be able to do- TRIANGLES	Things to remember		
A. Perform a dilation with a given scale factor	When the center of dilation is the origin, you can multiply each coordinate of the original figure, or pre- image, by the scale factor to find the coordinates of the dilated figure, or image.	1. Dilate with k = ½. 	

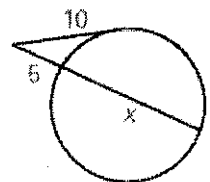
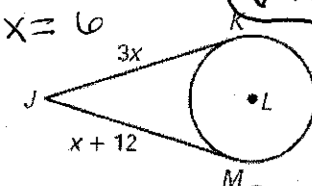
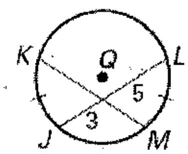
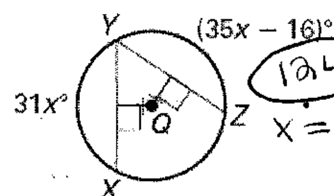
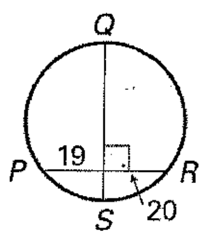
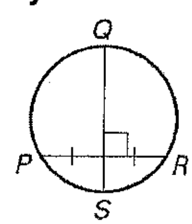
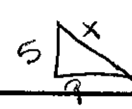
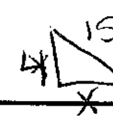
B. Find the missing side for similar figures.	Set up a proportion by matching up the corresponding sides. Then, solve for x.	2. $\frac{x}{7}=\frac{4}{6}$ $6x=28$ $x=4\frac{2}{3}$  $\frac{4}{6}=\frac{y}{8}$ $6y=32$ $y=5\frac{1}{3}$	3.  $\frac{5}{x}=\frac{4}{14}$ $4x=70$ $x=17.5$
	For these problems, the segment inside the triangle in parallel to the other side to create similar triangles. Set up proportions and solve. You may need to redraw the triangles.	4. $\frac{x}{3}=\frac{x+4}{6}$ $6x=3x+12$ $3x=12$ $x=4$ 	5.  $\frac{x}{17}=\frac{38}{16}$ $\frac{16x}{16}=\frac{646}{16}$ $x=40\frac{3}{8}$
C. Midsegment Theorem	The segment connecting the midpoints of two sides of the triangle is parallel to the third side and 1/2 the length of the third side.	6. Find PQ and TP  $\boxed{PQ=15}$ $30/2=15$ $32/2=16$ $\boxed{TP=16}$	7. Solve for x. 38  $2(x+19)=x+29$ $2x+38=x+29$ $-x$ $-x$ $x+38=29$ -38 -38 $\boxed{x=-9}$
D. Determine if 2 triangles are similar, and write the similarity statement.	Remember the 3 ways that you can do this: AA, SAS, SSS	8. ΔGNK ~ LAH by SSS  $\frac{6}{8}=\frac{3}{4}$ $\frac{15}{20}=3/4$ $\frac{9}{12}=\frac{3}{4}$	9. ΔABC ~ YXZ by AA ~ 
E. Find sin, cos, and tan ratios	Just find the fraction using SOHCAHTOA. The ratios for SOHCAHTOA are provided on the formula sheet.		**10.** Find sin A. $\frac{O}{H}=\frac{14}{22}=\boxed{\frac{7}{11}}$ **11.** Find tan B. $\frac{O}{A}=\frac{18}{14}=\boxed{\frac{9}{7}}$ **12.** Find cos B. $\frac{A}{H}=\frac{14}{22}=\boxed{\frac{7}{11}}$ **13.** Find tan A. $\tan A=\frac{14}{18}=\boxed{\frac{7}{9}}$

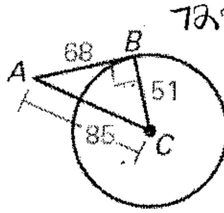
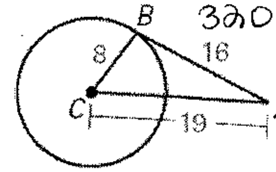
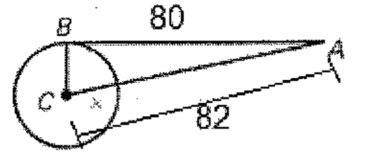
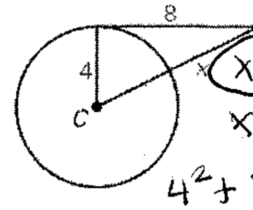
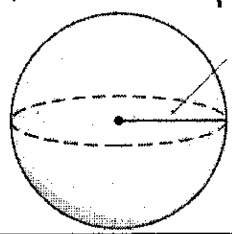
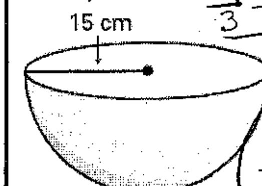
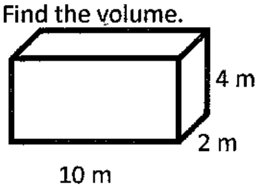
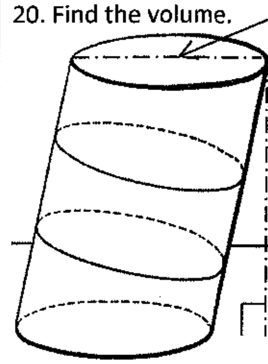


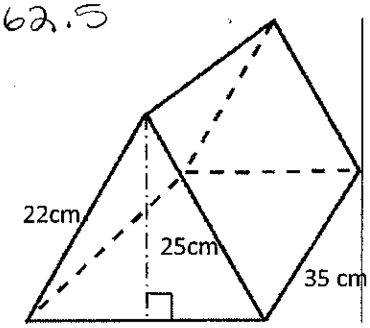
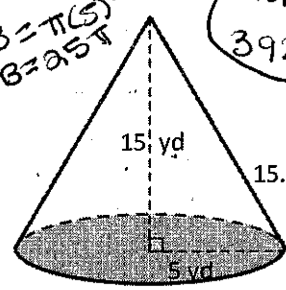
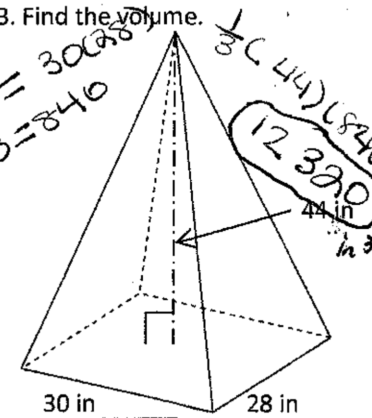
$5^2+x^2=13^2$
$x=12$

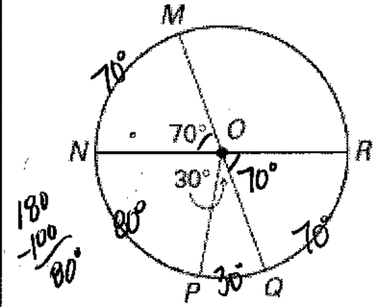
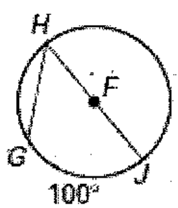
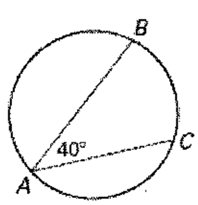
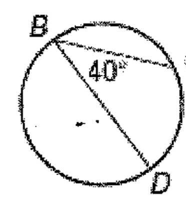
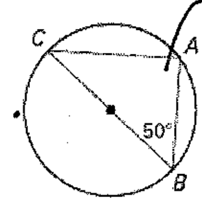
~~F. Know the relationship between the ratios for complementary angles.~~	$\sin\theta = \cos(90-\theta)$ $\cos\theta = \sin(90-\theta)$ $\tan\theta = \dfrac{1}{\tan(90-\theta)}$	**14.** Given Right ΔABC and $\sin\theta = 5/13$, find $\sin(90-\theta)$ *and* $\cos(90-\theta)$. $\sin(90-\theta) = \cos\theta = \frac{12}{13}$ $\cos(90-\theta) = \sin\theta = \frac{5}{13}$	
G. Use trig to find a missing side measure	Set up the ratio and then use your calculator. If the variable is on the top, multiply. If the variable is on the bottom, divide.	**15.** Find f. $\boxed{f = 2.95}$  $\sin(25) = f/7$ $7\sin(25) = 2$	**16.** Find m.  $\cos(85) = \frac{43}{m}$ $\frac{43}{\cos(85)} = m$ $m = 493.4$
H. Use trig to find a missing angle measure. Use the INVERSE function to find an angle..	On a TI-30 MultiView calculator, tap the trig button twice to get the INVERSE then type in the ratio.	**17.** Find p. $\sin^{-1}(13/40)$  $\boxed{18.99}$	
I. Trig Word Problems	Draw the picture. Label the sides. Set up the ratio, and solve.	**18.** From 25 feet away from the base of a building, the angle of elevation from the ground to the top of a building is measured to be 38°. How tall is the building?  $\tan(38) = \frac{x}{25}$ $25\tan(38)$ $x = 19.53$	

What you need to know & be able to do- CIRCLES	Things to remember	Examples	
Find the measure of parts of a chord in a circle	part • part = part • part	**1. Find the value of x**  $6 \cdot x = 3 \cdot 4$ $x = 2$	
Find the measure of segments when two secants intersect a circle.	outside • whole = outside • whole	**2. Find the value of x**  $6(6+4) = 5(5+x)$ $x = 7$	

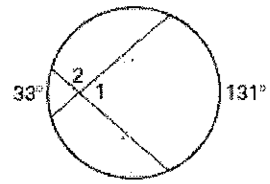
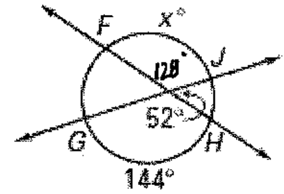
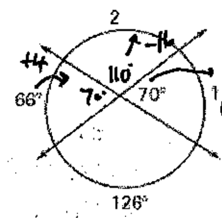
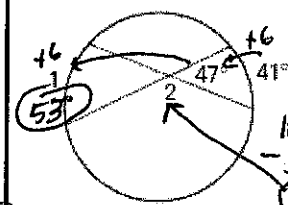
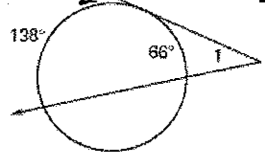
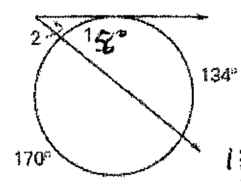
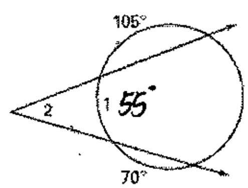
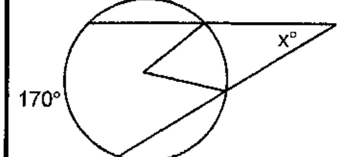
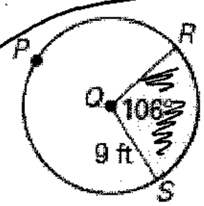
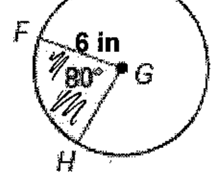
Find the measure of segments when a secant and a tangent intersect a circle.	outside • whole = outside • whole	**3. Find the value of x.**  x=15 $10^2 = 5(5+x)$	
Use the properties of congruent tangents	Tangents coming from the same external point are congruent	**4. Find JK.** JK=18 x= 6  $3x = x+12$	
Use the properties of congruent chords to find the measures of chords and arcs.	If two chords are congruent then their arcs are congruent	**5. Find the value of KM.**  KM = LJ Km=8	
Use the properties of congruent chords to find the measure of arcs and segments	Two chords are congruent if and only if they are equidistant from the center of the circle.	**6. Find the measure of YX.**  124 x = 4 $31x = 35x - 16$	
Determine if a chord is a diameter.	To be a diameter the chord must be a perpendicular bisector of another chord.	**7. Is $\overline{QS}$ a diameter? Why or why not?** no $19 \neq 20$ 	**8. Is $\overline{QS}$ a diameter? Why or why not?** yes ⊥ & bisector 
Use the properties of diameters and perpendicular chords to find the radius of a circle.	Set up the problem so that you can use Pythagorean theorem.	**9. A chord in a circle is 18 cm long and is 5 cm from the center of the circle. How long is the radius of the circle?** $5^2 + 9^2 = x^2$ x=10.3 	**10. The radius of a circle is 15 inches. A chord is drawn 4 inches from the center of the circle. How long is the chord?** $x^2 + 4^2 = 15^2$ x=14.5 

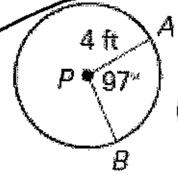
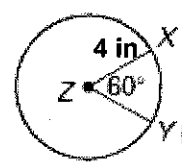
Use properties of tangents to determine if the line is a tangent	You must satisfy the Pythagorean Theorem.	11. Is $\overline{AB}$ **a tangent? Why or why not?** $51^2 + 68^2 = 85^2$ $7225 = 7225$  yes!	12. Is $\overline{AB}$ **a tangent? Why or why not?** $8^2 + 16^2 = 19^2$ $320 \neq 361$  NO!
Use properties of tangents to find missing measures.	A tangent is perpendicular to a radius (or diameter). Use Pythagorean Theorem to solve these problems.	13. Find the measure of x.  $x^2 + 80^2 = 82^2$ $x=18$	14. Find the value of x.  $x = 8.9$ $x = 4\sqrt{5}$ $4^2 + 8^2 = x^2$
Find the surface area of spheres.	$S = 4\pi r^2$	15. Find the surface area of the sphere. $4\pi(7)^2$  615.8 196π	16. What is the diameter of a sphere with a surface area of $44\pi\ cm^2$? $\cancel{44\pi} = 4\cancel{\pi} r^2$ $r^2 = 11$ $r = 3.3$ $d = 6.6$
Find the volume of spheres.	$V = \frac{4}{3}\pi r^3$	17. A beach ball has a diameter of 8 inches. Find its volume. $r = 4$ $V = \frac{4}{3}\pi(4)^3$ $\frac{256\pi}{3}$ or $268.1\ in^3$	18. Find the volume of the hemisphere.  $\frac{\frac{4}{3}\pi(15)^3}{2}$ 2250π or $7068.6\ cm^3$
Find the volume of prisms and cylinders.	V=Bh (where B is the area of the base) $A_{Rectangle}$= bh A_{Circle}= πr^2 $A_{Triangle}$= ½ bh $A_{Trapezoid}$ = ½(b_1+b_2)h	19. Find the volume.  $B = 4 \cdot 2 = 8$ $V = 8(10) = 80\ m^3$	20. Find the volume.  $B = \pi(6)^2$ $B = 36\pi$ $V = 36\pi \cdot 20$ 720π $2261.9\ in^3$

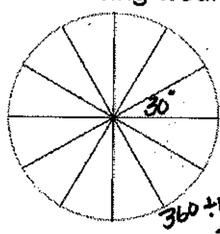
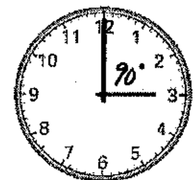
	B = 1/2(21)(25) = 262.5 V = 262.5(35) 9187.5 cm^3	21. Find the volume. 	
Find the volume of pyramids and cones.	V = 1/3 Bh	22. Find the volume. $B = \pi(5)^2$ $B = 25\pi$ 125π 392.7 yd^3  $V = 1/3(25\pi)(15)$	23. Find the volume. B = 30(28) B = 840 1/3(44)(840) ≈ 12,320 in^3 

Find the measure of arcs from central angles.	Angle = Arc		1. Find $m\widehat{MN}$ 70° 2. Find $m\widehat{QNR}$ 360 - 70 = 290° 3. Find $m\widehat{MR}$ 360 - 70 - 30 - 80 - 70 = 110° 4. Find $m\widehat{PRN}$ 360 - 80 = 280°
Find the measure of arcs and angles with inscribed angles	Angle = $\frac{\text{Arc}}{2}$	5. Find $m\angle GHJ$  $\frac{100}{2}$ = 50° 7. Find $m\widehat{BC}$  40 x 2 = 80°	6. Find $m\widehat{CD}$  40 x 2 = 80° 8. Find $m\angle C$  = 90° since $\widehat{CB}$ is a semicircle 180 -50 -90 40°

$\frac{x+144}{2} = 128$ or $x+144=256$

Find the measure of arcs and angles if the angle is inside the circle	$\text{Angle} = \frac{\text{Arc} + \text{Arc}}{2}$	9. Find $m\angle 1$ and $m\angle 2$  131 +33 164÷2 = 82°	10. Find the value of x. x = 112  144 −128 16; 180 −52 128°; 128 −16 112°
		11. Find 1 & 2  180 −70 110°; 74°; 126 −110 16; 110 −16 94°	12. Find 1 & 2  +6 +6; 53°; 180 −47 133°
Find the measure of arcs and angles if the angle is outside the circle.	$\text{Angle} = \frac{\text{Large Arc} - \text{Small Arc}}{2}$	13. Find 1. $\frac{138-66}{2} = m\angle 1$  138 −66 72÷2 = 36°	14. Find 1 & 2.  170 +134 304; 360−304=56; $\frac{134-56}{2} = m\angle 2$
		15. Find 1 & 2.  105 130 70 305; 360 −305 55; $\frac{130-55}{2}$ = 37.5	16. Find the value of x. $\frac{78}{2}$ = 39° 
Find the area of circles. (on the formula sheet)	$\text{Area} = \pi r^2$	17. The area of a circle is 31.4 cm². What is the radius? $\frac{\pi r^2}{\pi} = \frac{31.4}{\pi}$; $r^2 = 9.9949$; r = 3.16	18. Find the area of a circle with a diameter of 22 inches. $\pi r^2 = A$ r = 11; $A = \pi \cdot 11^2 = 121\pi \approx 380.1$ in²
Find the area of sectors. The formula is provided on the formula sheet but it is slightly different than what we used.	$\frac{\text{sector}}{\text{Area}} = \frac{m\widehat{AB}}{360}$ or, $\text{sector} = \frac{\pi r^2 \theta}{360}$	19. Find the area of the shaded region $\frac{\pi \cdot 9^2 \cdot 106}{360} = \frac{477\pi}{20}$ ft² or 74.9 	20. Find the area of the shaded region. $\frac{\pi \cdot 6^2 \cdot 80}{360} = 8\pi$ in² or 25.13 
Find the circumference of circles (on the formula sheet).	$C = 2\pi r$ $C = \pi d$	21. Find the circumference of a circle with a radius of 8 m. $C = 2\pi \cdot 8 = 16\pi$ m or 50.3 m	22. The circumference of a circle is 25.12 ft. What is the radius? $\frac{2\pi r}{2\pi} = \frac{25.12}{2\pi}$; r = 4.0 ft

Find arc lengths. The formula is provided on the formula sheet but it is slightly different than what we used.	$\frac{\text{Arclength}}{\text{Circumference}}=\frac{m\widehat{AB}}{360}$ Or, $\text{arclength}=\frac{2\pi r\theta}{360}$	23. Find the arc length of $\widehat{AB}$  $\frac{2\pi\cdot4(97)}{360}$ $\frac{97\pi}{45}\approx$ 6.77 ft	24. Find the arc length of $\widehat{XY}$.  $\frac{2\pi\cdot4\cdot60}{360}$ $\frac{4\pi}{3}\approx$ 4.19 in

Word Problems	25. A birthday cake has a radius of 4 in. What is the length of icing needed to go around the end of the whole cake? How much icing would be used for one slice?  whole cake $C=2\pi r$ $=2\pi\cdot4=8\pi$ $=25.13$ in; one slice $360\div12=30°$; $\frac{2\pi\cdot4(30)}{360}=\frac{2\pi}{3}\approx2.1$ in	26. A wall clock has an area of 452.39 in^2. Find the diameter of the clock. Then, find the area of the sector formed when the time is 3:00.  $\frac{A=\pi r^2}{\pi}=\frac{452.39}{\pi}$; $r^2=144.00$; $r=12$; $d=24$; sector $=\frac{\pi r^2\theta}{360}=\frac{\pi\cdot12^2\cdot90}{360}=36\pi\approx113.1$
Things to Know- Geometry in the Coordinate Plane	Use points A(2,6), B(-1,8) and C(4,10) for the following.	
	Midpoint = $\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$ This is not on the formula sheet.	1. Find the midpoint of segment AB. $\left(\frac{2+-1}{2},\frac{6+8}{2}\right)=\left(\frac{1}{2},7\right)$
These formulas are NOT on the EOC formula sheet.	Slope-intercept form: $y = mx + b$ Slope: $m=\frac{y_2-y_1}{x_2-x_1}$	2. Find the equation of the line containing A and C. $m=\frac{10-6}{4-2}=\frac{4}{2}=2$ $y=2x+b$ use $(2,6)$ $6=2(2)+b$ $b=2$ $y=2x+2$
This formula is on the EOC formula sheet.	**Circle:** $(x-h)^2+(y-k)^2=r^2$ $r=d=\sqrt{(2--1)^2+(6-8)^2}$ $=\sqrt{3^2+(-2)^2}$ $=\sqrt{9+4}=\sqrt{13}$	3. Write the equation of a circle with A as the center containing point B. (Hint: use distance formula to find the radius.) $(x-2)^2+(y-6)^2=13$
This formula is on the EOC formula sheet.	**Distance =** $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$	4. Find the distance between A and C. $d=\sqrt{(2-4)^2+(6-10)^2}=\sqrt{(-2)^2+(-4)^2}$ $=\sqrt{20}=2\sqrt{5}\approx4.47$
The formula on the EOC formula sheet is slightly different.	partitioning: $(x_2-x_1)\left(\frac{a}{a+b}\right)+x_1$ $(2,6)$ $(4,10)$ $(4-2)\left(\frac{1}{1+3}\right)+2=$ 2.5 partitioning: $(y_2-y_1)\left(\frac{a}{a+b}\right)+y_1$ $(10-6)\left(\frac{1}{1+3}\right)+6=$ 7	5. Find the coordinates of point T so that it partitions AC into a ratio of 1:3. $(2.5, 7)$