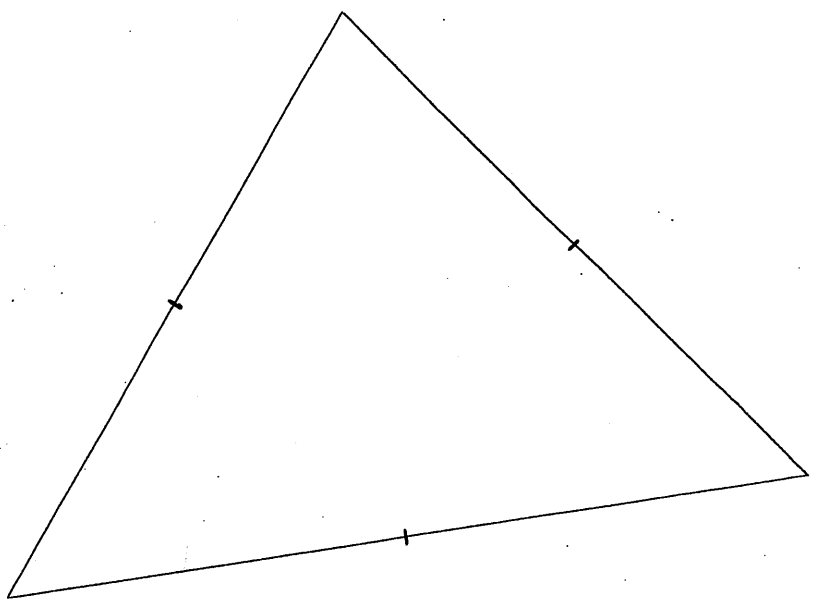
Geometry Spring Recovery Course
May 2016

Name: _____

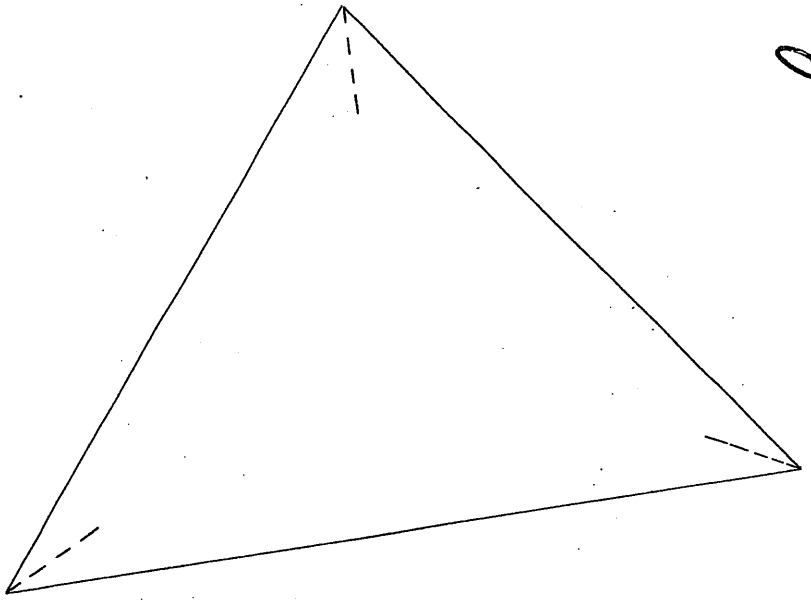
Perpendicular Bisectors in Triangles



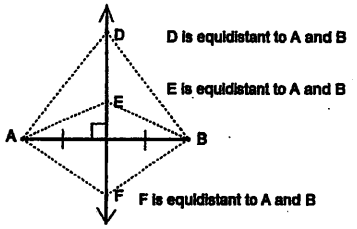
Concurrent lines-

Point of Concurrency-

Angle Bisectors in Triangles



Perpendicular Bisector Theorem-



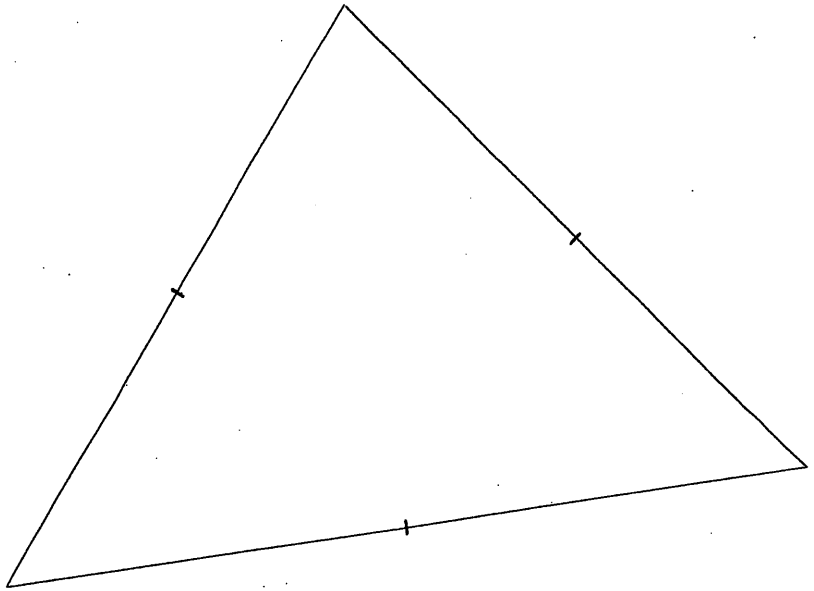
D is equidistant to A and B

E is equidistant to A and B

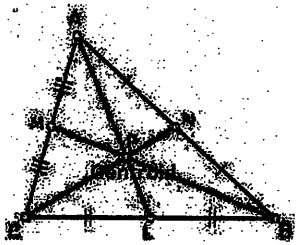
F is equidistant to A and B

(1)

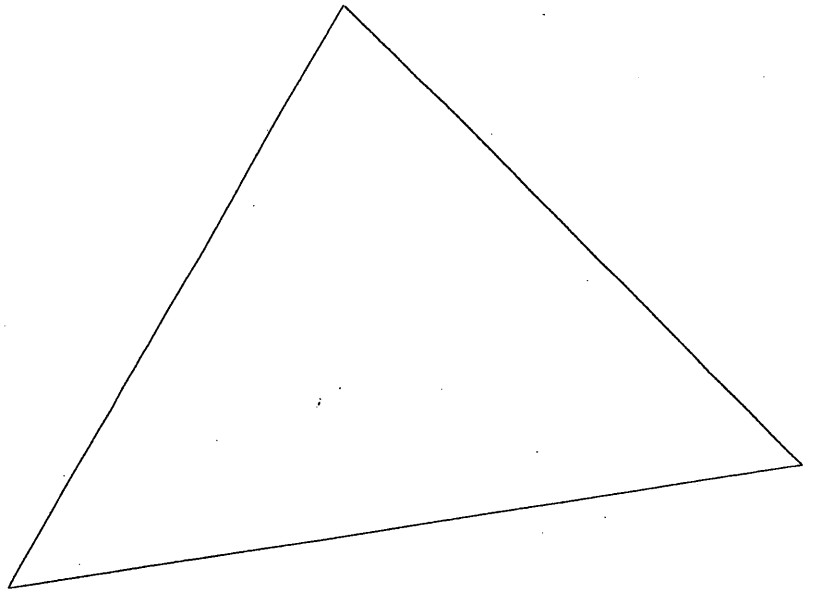
Medians of Triangles



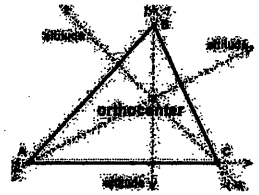
Centroid Theorem-



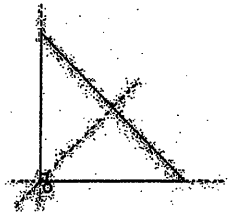
Altitudes in Triangles



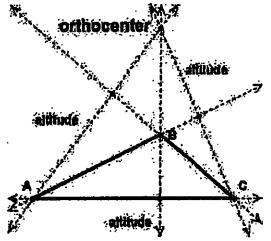
Acute



Right



Obtuse



Ex 1 In the above triangle, if AD = 10, AB = 26, find BD.

Name _____ Date _____ Period _____

Geometry
Points of Concurrency Homework

ibe how each of the points of concurrency is found. Be specific!

Centroid _____

_____

Incenter _____

_____

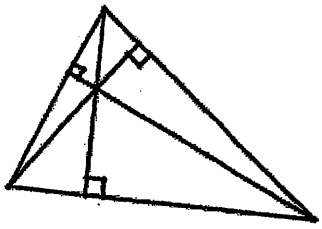
Circumcenter _____

_____

Orthocenter _____

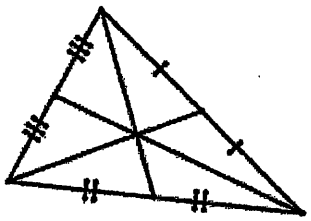
---

ch figure below, tell what point of concurrency is shown and what constructions form that point:



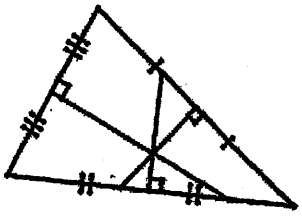
Point: _____

Formed by: _____



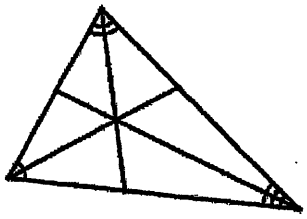
Point: _____

Formed by: _____



: _____

Formed by: _____



Point: _____

Formed by: _____

Important Questions (use your graphic organizer to help):

1. Which points of concurrency are always inside the triangle? _____

2. Which point of concurrency is always on the vertex of a right triangle? _____

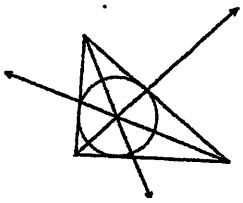
3. Which point of concurrency is always on the midpoint of the hypotenuse in a right triangle? _____

4. Which points of concurrency are always outside of an obtuse triangle? _____

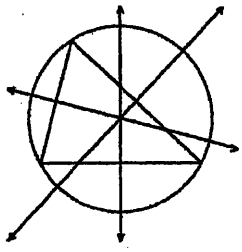
5. Which point of concurrency is the center of gravity in a triangle? _____

6. Which point of concurrency is equidistant from every vertex? _____

7. Which point of concurrency is the center of an inscribed circle as shown below? _____



8. Which point of concurrency is the center of a circumscribed circle as shown below? _____



Point G is the Centroid of ΔABC. AD = 8, AG = 10, and CD = 18. Find the length of the given segment.

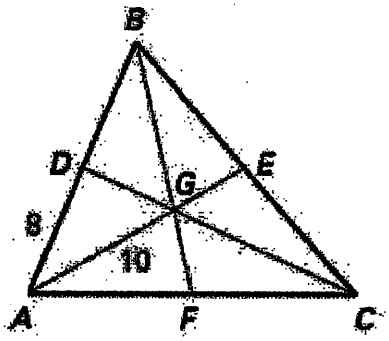
9. BD _____

10. AB _____

11. EG _____

12. AE _____

13. CG _____ 14. DG _____



D is the centroid of ΔABC, AE = 12, AD = 10, CF = 12. Find the length of each segment.

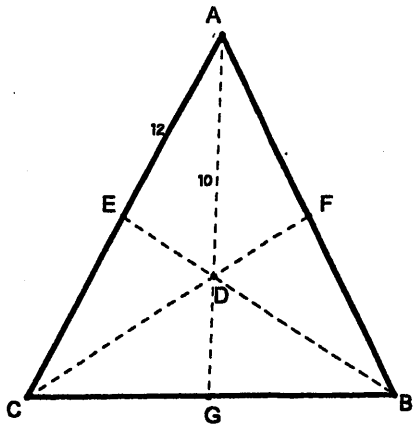
15. DG _____

16. AG _____

17. EC _____

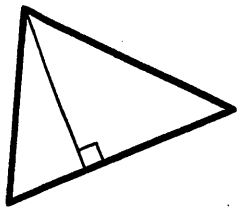
18. AC _____

19. DF _____ 20. CD _____



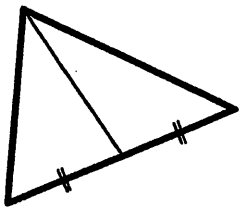
Name: _____ **Geometry – Points of Concurrency Worksheet**

Circle the letter with the name of the segment/line/ray shown.



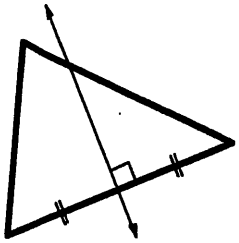
(a) perpendicular bisector
(b) angle bisector
(c) median
(d) altitude

2.



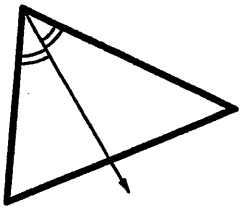
(a) perpendicular bisector
(b) angle bisector
(c) median
(d) altitude

3.



(a) perpendicular bisector
(b) angle bisector
(c) median
(d) altitude

4.



(a) perpendicular bisector
(b) angle bisector
(c) median
(d) altitude

Circle the letter with the name of the correct point of concurrency.

5. The three altitudes of a triangle intersect at the _____.

(a) circumcenter (b) incenter (c) centroid (d) orthocenter

6. The three medians of a triangle intersect at the _____.

(a) circumcenter (b) incenter (c) centroid (d) orthocenter

7. The three perpendicular bisectors of a triangle intersect at the _____.

(a) circumcenter (b) incenter (c) centroid (d) orthocenter

8. The three angle bisectors of a triangle intersect at the _____.

(a) circumcenter (b) incenter (c) centroid (d) orthocenter

9. It is equidistant from the three vertices of the triangle.

(a) circumcenter (b) incenter (c) centroid (d) orthocenter

10. It is equidistant from the three sides of the triangle.

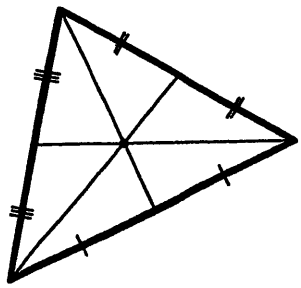
(a) circumcenter (b) incenter (c) centroid (d) orthocenter

11. It divides each median into two sections at a 2:1 ratio.

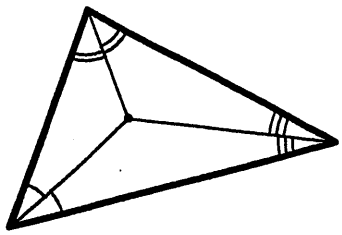
(a) circumcenter (b) incenter (c) centroid (d) orthocenter

Name the point of concurrency shown.

12.



13.



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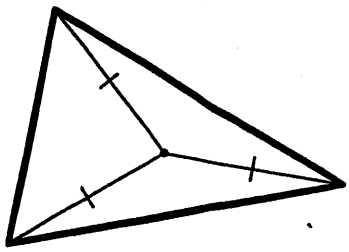

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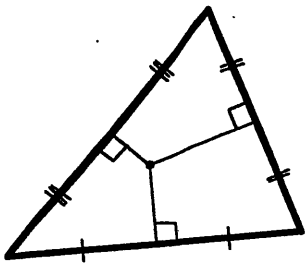
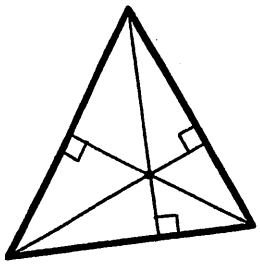
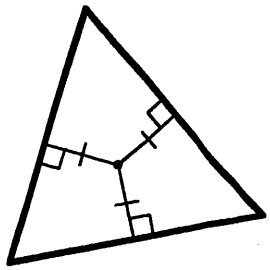


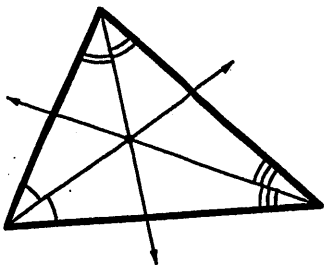
16.



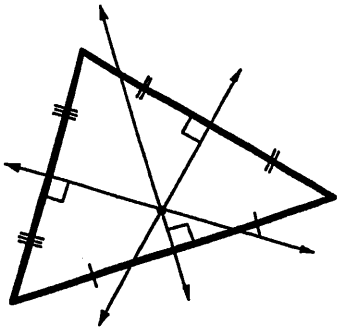
17.



18.



19.



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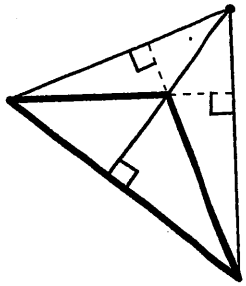
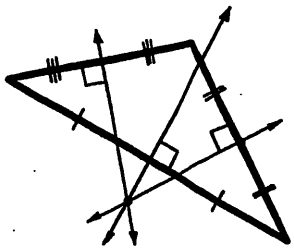


21.



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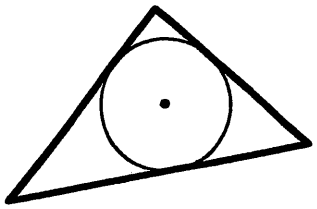
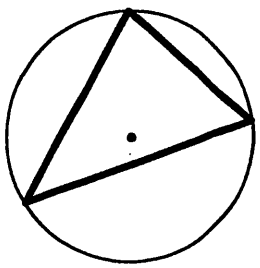


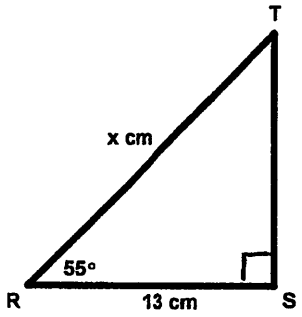
23.



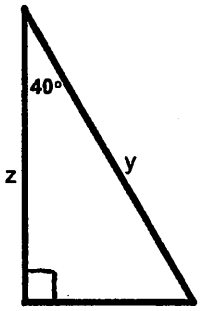
Name _____ Date: SOH CAH TOA Period: _____

Analytic Geometry **Right Triangle Trigonometry Practice**

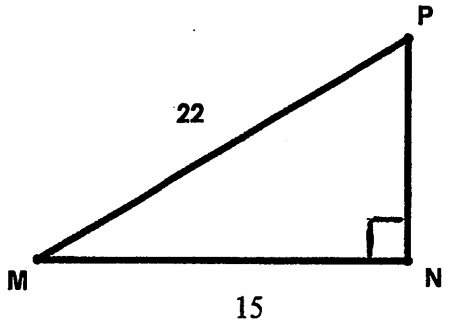
1. What is the value of x? Round your answer to the nearest thousandth.



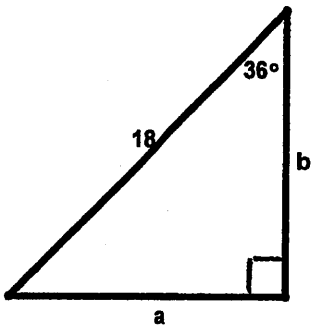
2. Find the lengths of y and z in the diagram below.



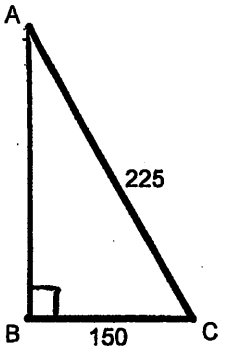
3. What is the measure of $\angle P$?



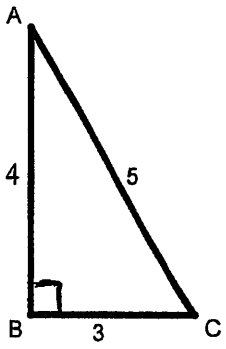
4. What is the value of a and b to the nearest tenth?



5. What is the measure of $\angle A$ to the nearest degree?



6. Suppose ΔABC is a right triangle with $\angle B$ the right angle. Explain the relationship between Tangent of angle A and Tangent of angle C.



7. Explain the relationships between the sine and cosine of complementary (the 2 acute angles) angles. (Use triangle ABC above and find sinA and cosC.

8. In right ΔACB, AC = 3, BC = 4, and AB = 5. Draw a figure.

   A. Find the exact value of sin B. _____

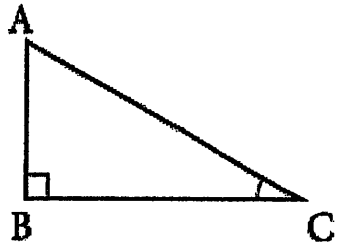
   B. Find the exact value of cos A. _____

   C. Find the exact value of tan A. _____

   D. Find measurement of $\angle A$ (to the nearest degree). _____

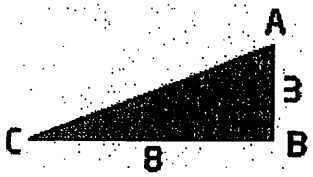
9.

In $\triangle ABC$, AB = 8 cm and BC = 11 cm. Determine the tangent ratio of $\angle A$, to the nearest thousandth.



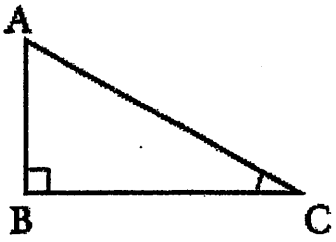
10.

Determine the measure of $\angle C$, to the nearest degree.



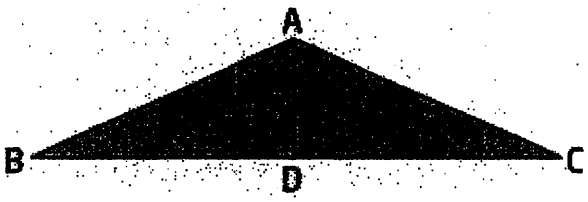
11.

In the triangle, BC = 12 cm and $\sin A = 0.58\overline{3}$. What is the length of the hypotenuse, to the nearest tenth of a centimeter?



12.

A roof is shaped like an isosceles triangle. The slope of the roof makes an angle of 24° with the horizontal, and has an altitude of 3.5 m. Determine the width of the roof, to the nearest thousandth of a meter.



13) In right ΔABC, $\sin A = \frac{21}{29}$ and angle C is a right angle. Draw a figure. **Write all trigonometric ratios as simplified fractions.**

A) $\tan A =$ _____

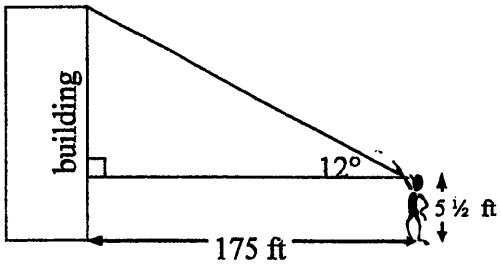
E) $\cos B =$ _____

F) $\sin B =$ _____

G) Find the measure of angle B to the nearest thousandth. _____

14. A 24 foot ladder leans against a building and makes an angle of 68° with the ground. To the nearest foot, how far up from the bottom of the building is the top of the ladder?

15. A man that is 5 ½ feet tall walks 175 feet from a building and looks at the highest point on the building. The angle formed by the person's line of sight and the horizontal is 12°. To the nearest foot, how tall is the building?



16. You are building a tent. The rope from the top of the tent pole to the ground measures 5 ft long. The angle of elevation is 68°.

A. Find the height of the pole to the nearest thousandth.

B. Find the distance from the base of the pole to the stake to the nearest thousandth.

17. If a 200 foot tree casts a 118 foot shadow, what is the angle of elevation of the sun? *Sketch a diagram, set up an equation and solve.*

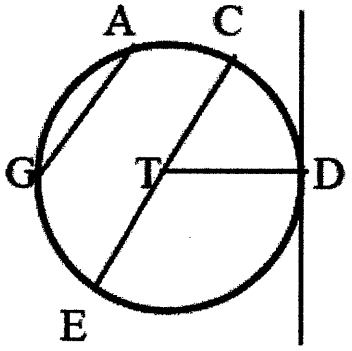
18. A plane is flying away from you. Right now, you can see it at an angle of elevation of 56°. Thirteen seconds later, you can see it an angle of 53°. If you know it's at an altitude of 8,000 feet, how far has it traveled in that time? B) How fast is it traveling?

Geometry
Ch. 10 Circles Review

Name_____
Date_____ Period____

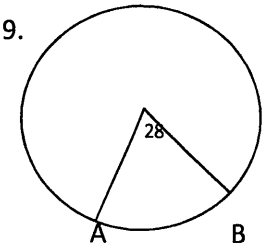
For the following questions, identify the part in the diagram.

1. A chord_____
2. A diameter _____
3. A central angle _____
4. A radius _____
5. A tangent line _____
6. A minor arc _____
7. A major arc_____
8. A semicircle _____



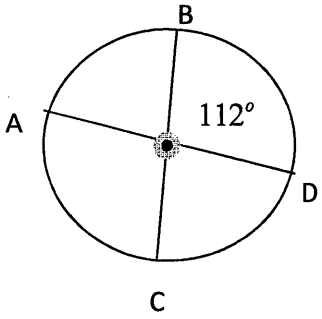
For the following circles, find the missing measure or measures

9.



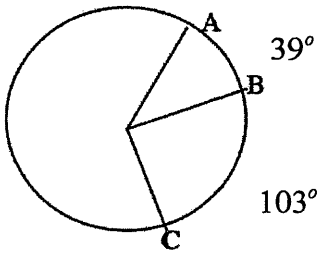
$m\overset{\frown}{AB}$ =

10.



$m\overset{\frown}{AB}$ = $m\overset{\frown}{ADC}$ =

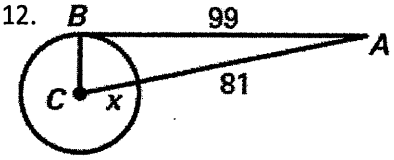
11.



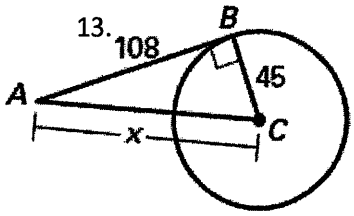
$m\overset{\frown}{AC}$ =

Using your knowledge of circles, solve for x.

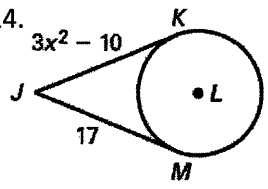
12.



13.

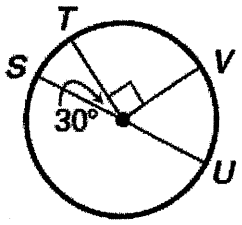


14.



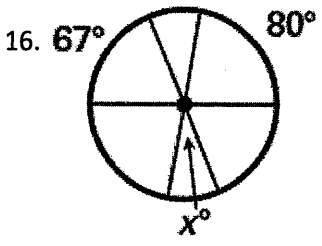
Solve for the indicated arc measure or angle.

15.



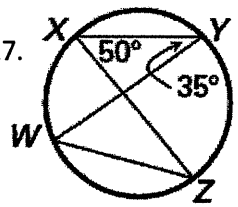
$m\overset{\frown}{TU}$ =

16.



X =

17.

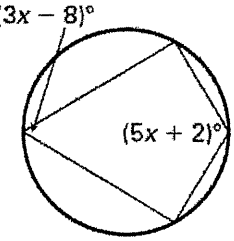


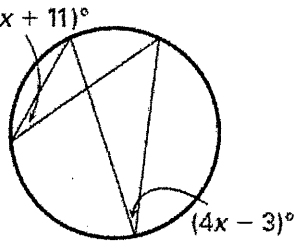
$m\overset{\frown}{XW}$ = $\angle XZW$ = $m\overset{\frown}{YZ}$ =

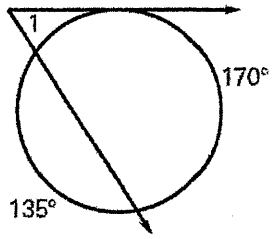
$m\overset{\frown}{XY}$ =

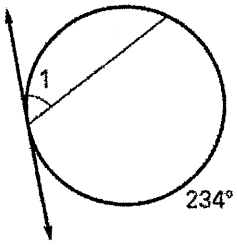
11

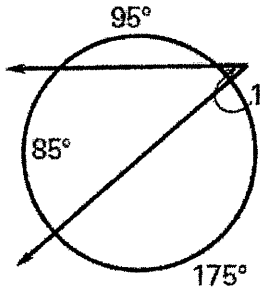
Solve for the indicated arc measure or angle

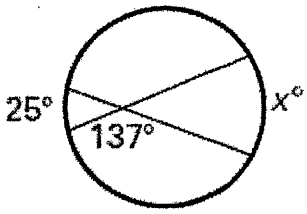
18. 

19. 

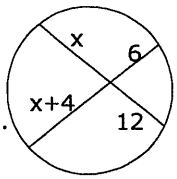
20. 

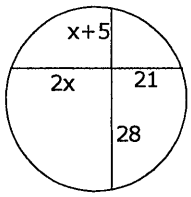
21. 

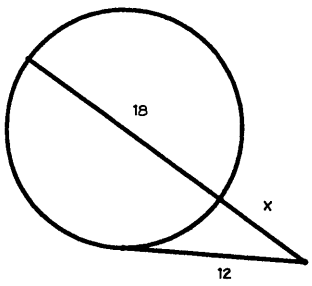
22. 

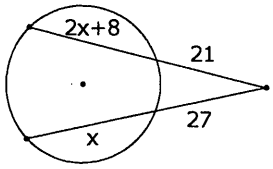
23. 

Find the value of x in the figures below.

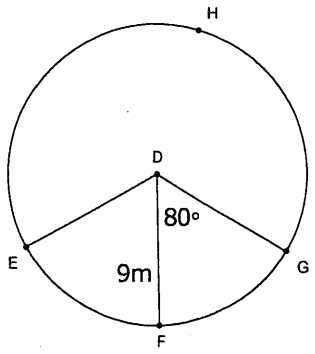
24. 

25. 

26. 

27. 

28. In Circle D, $\angle EDF \cong \angle FDG$. Find the indicated measures.



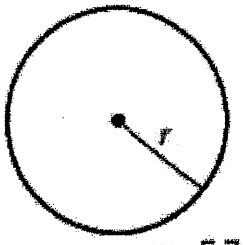
a. Circumference of circle D

b. Arc length of $\overset{\frown}{EFG}$

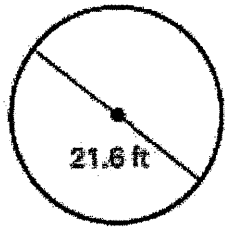
29. What is the degree measure of an arc of a circle with a radius of 4 cm and an arc length of 3π cm?

Find the circumference.

30.

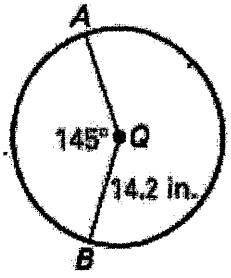


31.

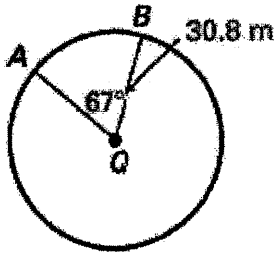


Find the length of $\overset{\frown}{AB}$.

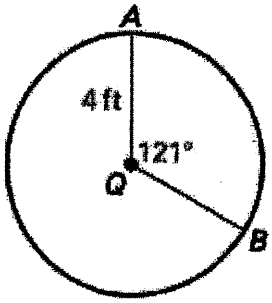
31



32.

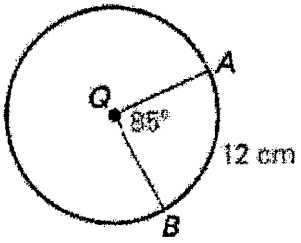


33.

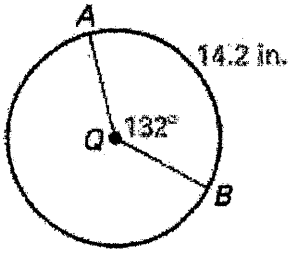


Find the indicated measure.

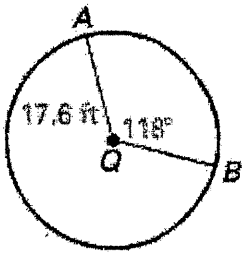
34. Circumference of $\odot Q$



35. Radius of $\odot Q$

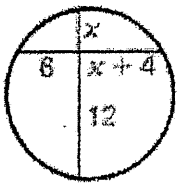


36. Length of $\overset{\frown}{AB}$

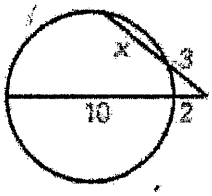


Find the value of x.

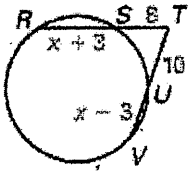
37.



38.



39.



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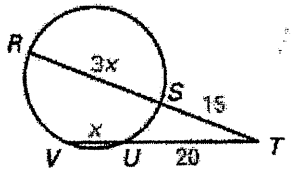

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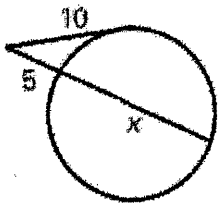

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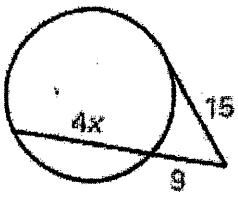

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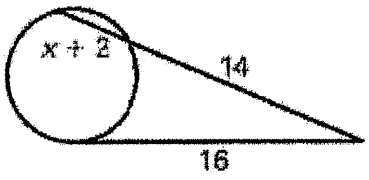
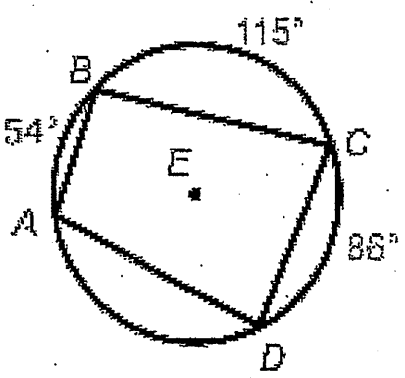


Chapter 10 Review 2

1. Quadrilatera $ABCD$ is inscribed in $\odot E$



Find :

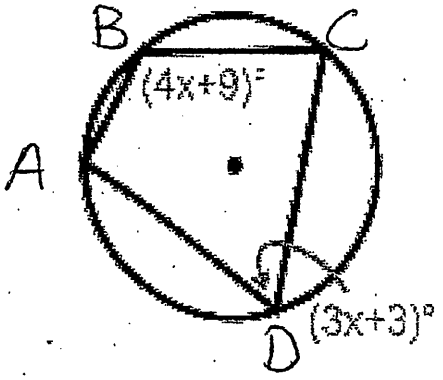
a) $m\angle A =$

b) $m\angle B =$

c) $m\angle C =$

d) $m\angle D =$

2.



Find :

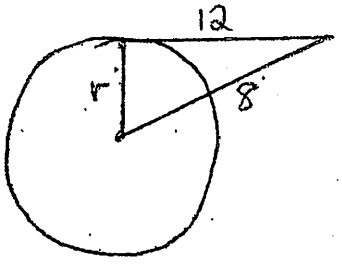
a) $m\angle B$

b) $m\angle D$

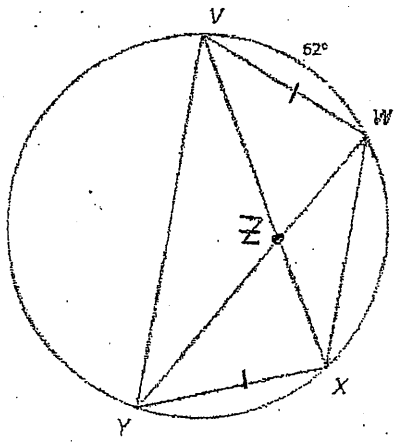
c) Find $m\overset{\frown}{ADC}$

d) Find $m\overset{\frown}{ABC}$

3. Find r:



3. Fill in all arcs and angle measures.

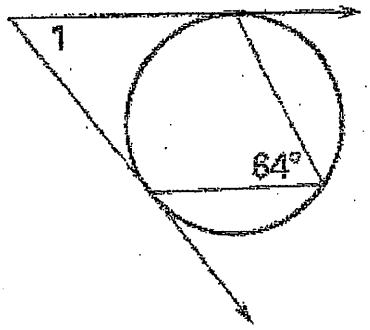


a. Find $m\angle VZW$ _____

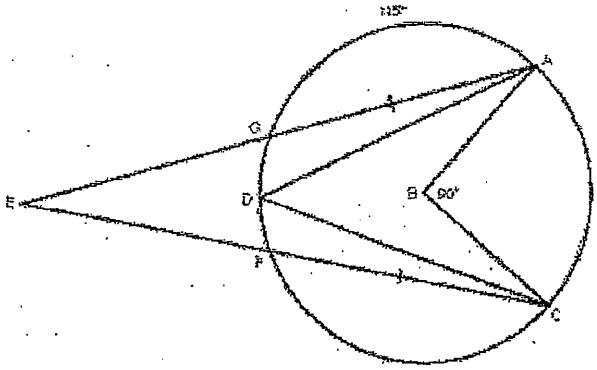
b. Find $m\overset{\frown}{WX}$ 70°

c. Find $m\overset{\frown}{VY}$ _____

d. Find $m\angle WYX$ _____



Find $m\angle 1$ _____

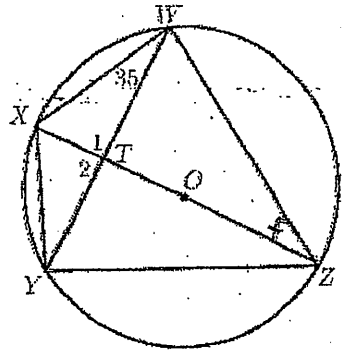


$M\overset{\frown}{FG}$ = _____

m ∠AEC = _____

m ∠ADC = _____

Given circle with centre O, $\overline{WT} = \overline{TY}$ and $\overset{\frown}{XWT} = 35°$

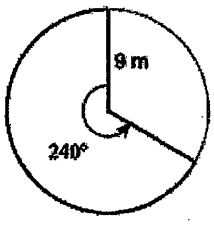


$m\angle 1$ = _____ $m\angle 2$ = _____

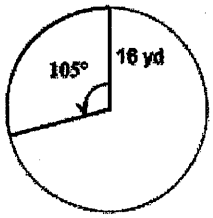
$m\angle f$ = _____ $m\angle WYZ$ = _____

Find the area of each sector.

1)

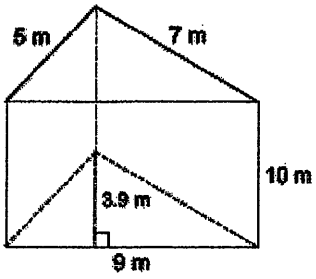


2)

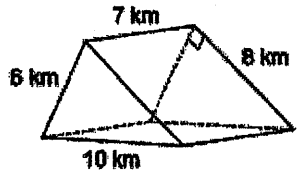


Find the volume of each figure. Round your answers to the nearest hundredth, if necessary.

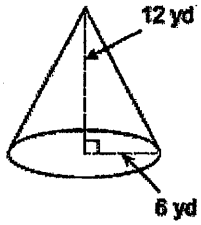
3)



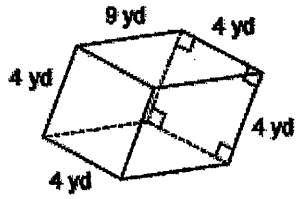
4)



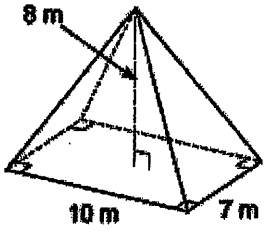
5)



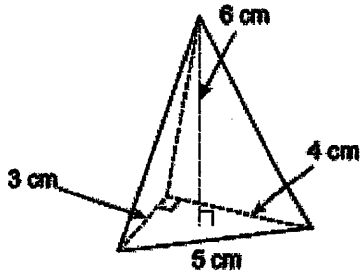
6)



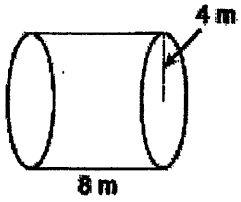
7)



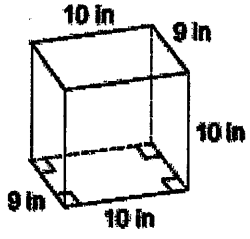
8)



9)



10)



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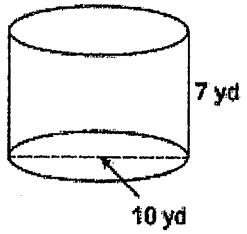

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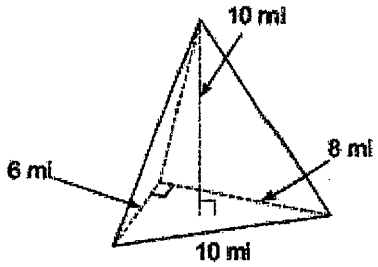

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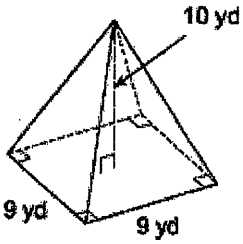

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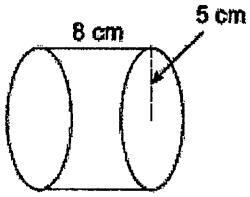
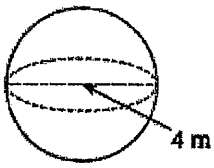
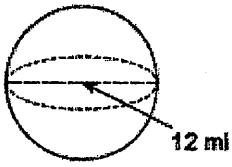


15)

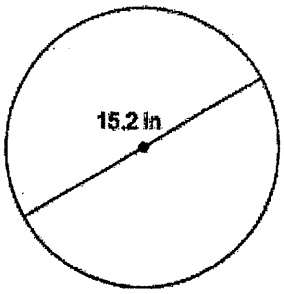


16)



Find the area of each. Use your calculator's value of π. Round your answer to the nearest tenth.

17)



18) radius = 10.6 cm

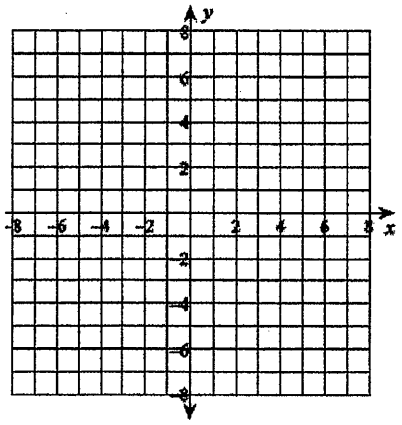
Area		Volume	
Triangle	$A = \frac{1}{2}bh$	Cylinder	$V = \pi r^2 h$
Rectangle	$A = bh$	Pyramid	$V = \frac{1}{3}Bh$
Circle	$A = \pi r^2$	Cone	$V = \frac{1}{3}\pi r^2 h$
Area of a Sector of a Circle		Sphere	$V = \frac{4}{3}\pi r^3$
Area of Sector $= \frac{\pi r^2 \theta}{360}$		Prism	$V = Bh$

Geometry Circles, Slope of Lines, Line Segment Partitions Review #1 Name: _____

Equation of Circle: $(x-h)^2+(y-k)^2=r^2$

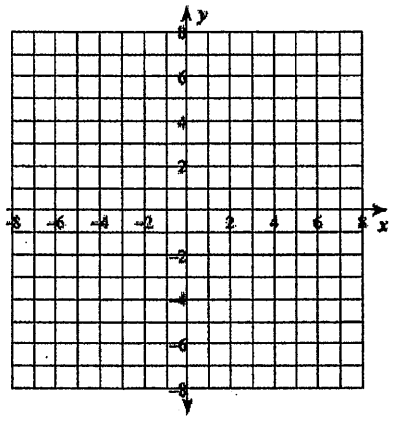
1. Identify the center and the radius of the circle. Then sketch the graph

$(x-2)^2+(y-4)^2=1$



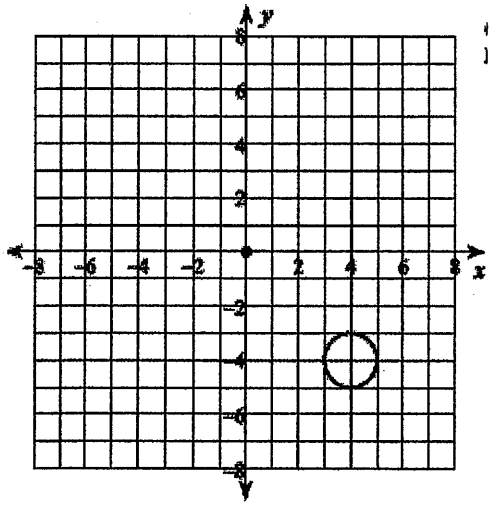
Center: _____ Radius _____

$(x-3)^2+(y-3)^2=4$



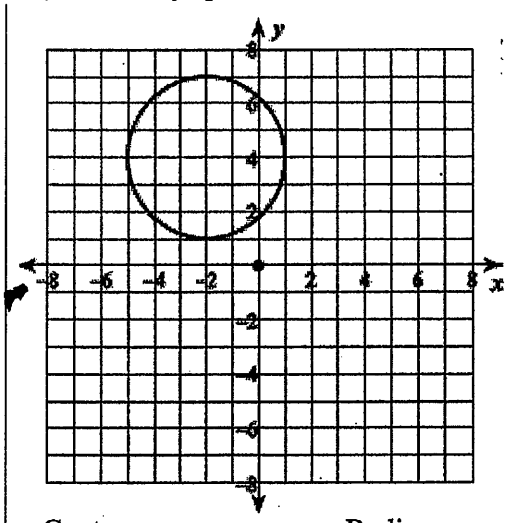
Center: _____ Radius _____

2. Write the equation of the circle in standard form, given the graph below:



Center_____ Radius: _____

Circle Equation: _____



Center_____ Radius: _____

Circle Equation: _____

3. Write the equation of the circle in standard form given that center: (4, -8) Radius: 3

_____

4. The equation of the circle is $(x-1)^2+(y+5)^2=25$. Tell whether each point is on the circle, in the interior of the circle, or in the exterior of the circle:

a) (1, 0)

b) (-3, -1)

5. Write the below equation in standard form. Then identify the center and the radius of the circle:

$x^2 + y^2 - 24x - 16y + 204 = 0$

Standard form:

_____

Center: _____

Radius: _____

Write the standard form of the equation of the line described.

Steps: **1)** find slope of the given line **2)** plug in point and slope into slope-intercept form, **y = mx+b** and solve for b

3) Write final equation in slope-intercept form (y = mx + b). Leave x and y as variables, replacing only **m** and **b**

6. through: (-2, 10), perpendicular to $y = 3x - 3$

7. through: (1, -5), parallel to $y = -\frac{1}{5}x - 2$

Partitioning Line Segments

Steps: **1)** rewrite ratio as a fraction **2)** Label points and find Δx $(x_2 - x_1)$ and Δy $(y_2 - y_1)$ **3)** Find location of new ordered pair: X-coordinate: $ratio \times \Delta x + x_1$ Y-coordinate: $ratio \times \Delta y + y_1$

8. Given the points A(-2, 4) and B(7, -2), find the coordinates of the point P on directed line segment $\overline{AB}$ that partitions $\overline{AB}$ in the ratio 1:2.

9. Find the coordinates of point P that lies on the line segment $\overline{MQ}$, M(-9, -5), Q(3, 5), and partitions the segment at a ratio of 2 to 5

Geometry **Completing the Square Review and Circle Equations Worksheet 2**

Recall: Circle Equation in Standard Form: $(x-h)^2+(y-k)^2=r^2$ **Center: (h, k) Radius: r**

Write the below equations in standard form, then identify center and radius of circle:

1) $x^2+y^2+14x-22y+150=0$

2) $x^2+y^2-2x+16y-16=0$

3) $x^2+y^2-4x-18y+60=0$

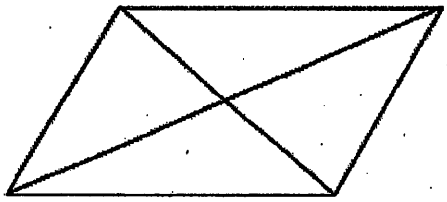
4) $x^2+y^2-26x-16y+229=0$

5) $x^2+y^2+20x+32y+351=0$

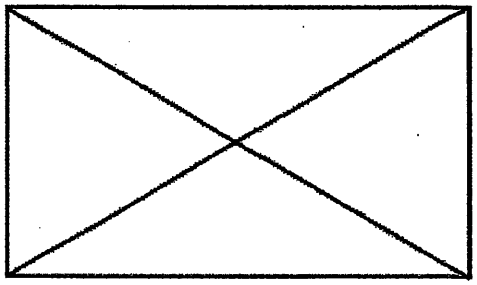
6) $x^2+y^2-6x+24y+128=0$

Geometry Classifying Quadrilaterals Summary Review

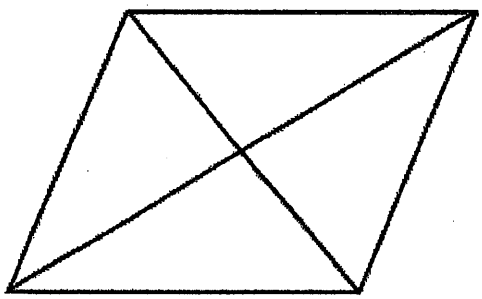
Properties of a parallelogram:
1. Opposite sides are parallel.
2. Opposite sides are congruent.
3. Opposite angles are congruent.
4. Consecutive angles are supplementary.
5. Diagonals bisect each other.



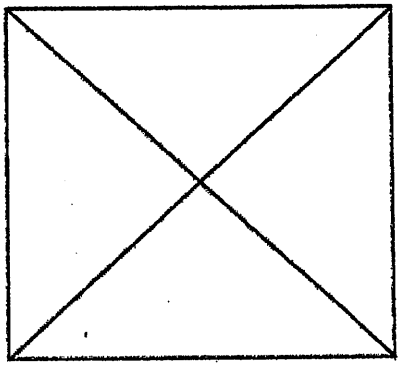
Properties of a rectangle:
1. Opposite sides are parallel.
2. Opposite sides congruent.
3. Opposite angles congruent.
4. Consecutive angles supplementary.
5. Diagonals bisect each other.
6. Four right angles.
7. Diagonals are congruent.



Properties of a rhombus:
1. Opposite sides parallel.
2. Opposite sides congruent.
3. Opposite angles congruent.
4. Consecutive angles supplementary.
5. Diagonals bisect each other.
6. Four congruent sides.
7. Diagonals are perpendicular.
8. Diagonals bisect opposite angles.



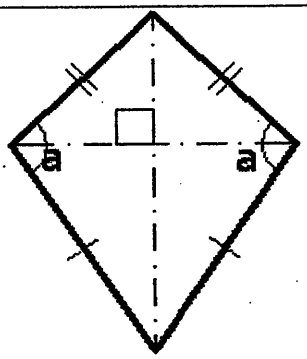
Properties of a square:
1. Opposite sides parallel.
2. Opposite sides congruent.
3. Opposite angles congruent.
4. Consecutive angles supplementary.
5. Diagonals bisect each other.
6. Four right angles.
7. Diagonals congruent.
8. Four congruent sides.
9. Diagonals are perpendicular.
10. Diagonals bisect opposite angles.



Kite:

Properties of a Kite:

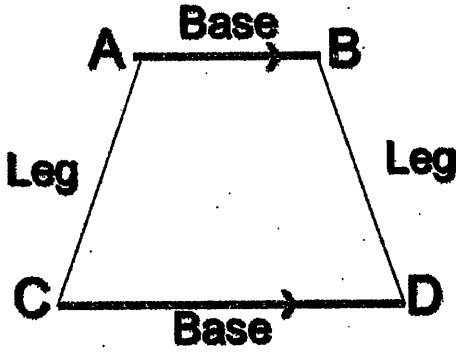
- The diagonals of a kite are **perpendicular**
- angles (***a***)are congruent
- Vertex diagonal bisects the vertex angles
- Vertex diagonal bisects the non-vertex diagonal



Trapezoids – quadrilateral with exactly one pair of parallel sides

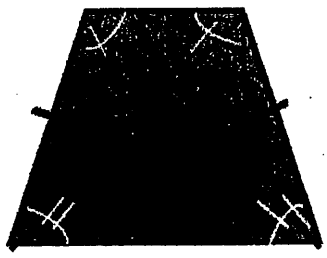
Properties:
*Leg Angles are Supplementary

$m\angle A + m\angle C = 180$
$m\angle B + m\angle D = 180$



Isosceles Trapezoids

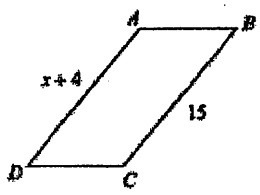
Base Angles Are congruent
Diagonals are congruent



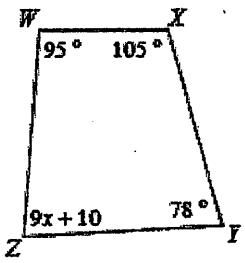
Quadrilaterals and Polygons REVIEW Name_____ Date_____Period____

Solve for x. The figure below is a parallelogram:

1.

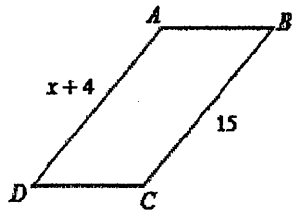


2.

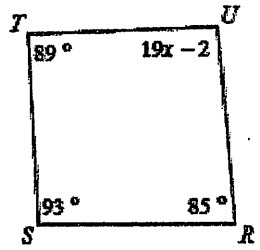


Solve for x. The figure below is a parallelogram:

3.

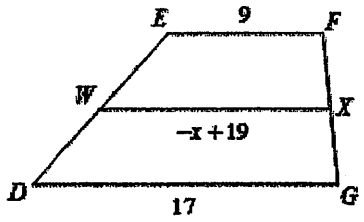


4.



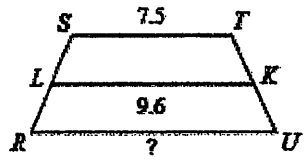
Solve for x. The figure below is a trapezoid:

5.



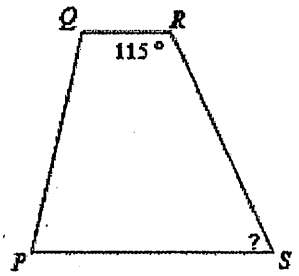
Find the length of the base indicated by the trapezoid

6.



Find the measurement of the missing angles indicated for each trapezoid

7.



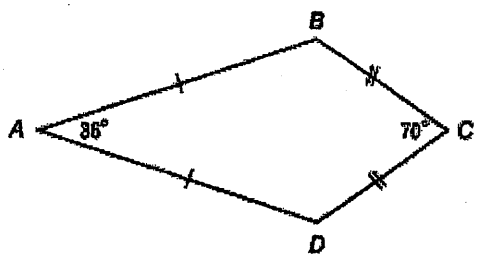
$m\angle S$ _____

$m\angle Q$ _____

$m\angle P$ _____

Find the indicated angle measures:

8.

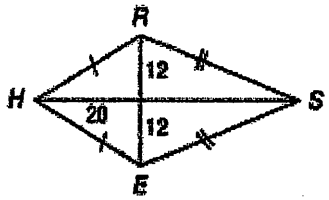


$m\angle B$ _____

$m\angle D$ _____

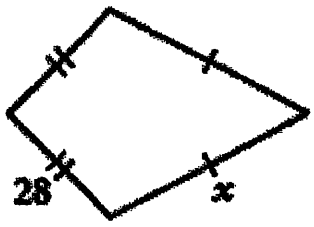
Find the indicated side lengths of the kite below:

9.



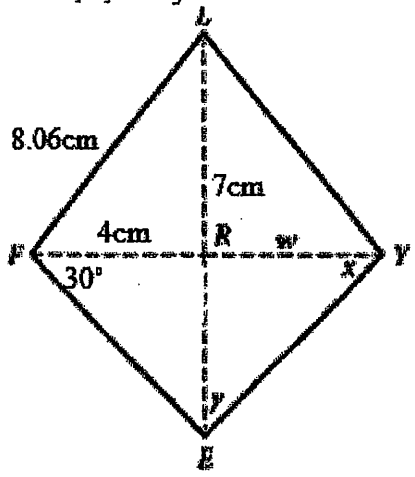
$RH =$ _____

10. The perimeter of this kite is **116**. Find x.

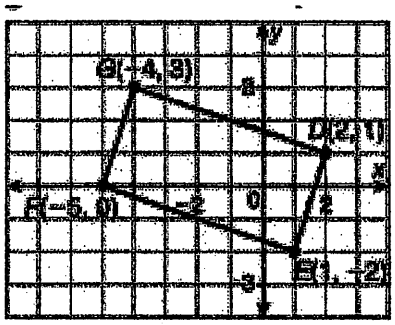


11.

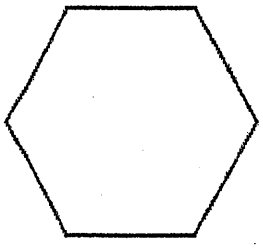
FLYE is a kite with FL = LY.
Find w, x, and y.



12. Use distance and slope to verify whether parallelogram below is a rectangle, rhombus, or a square.



13. Find the measure of one interior angle in each polygon. Round your answer to the nearest tenth if necessary.



14. If the sum of the interior angles is 2340°, find the number of sides for the polygon.

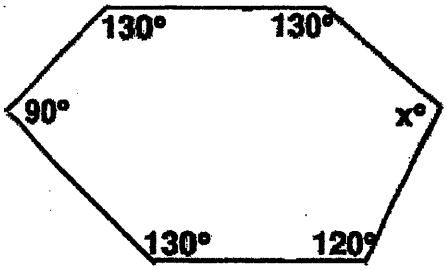
15. If each of the exterior angles is 30°, find the number of sides for the polygon

16. If each of the interior angles is 135°, find the number of sides for the polygon

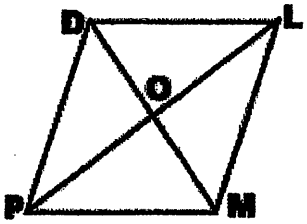
17. Find the other endpoint of the line segment with the given endpoint and midpoint.

Endpoint: (8, -8), midpoint: (5, 3)

18. Solve for x:



19. In rhombus DLMP, DM = 24, m∠LDO = 43°, and DL = 13. Find each of the following.



a) OM = _____

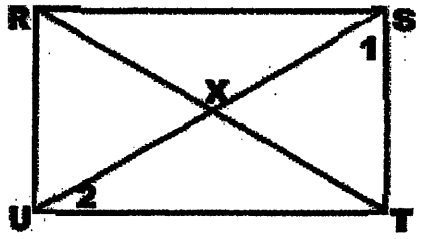
b) m∠DOL = _____

c) m∠DLO = _____

d) m∠DML = _____

e) DP = _____

20. Use the following rectangle for parts a and b

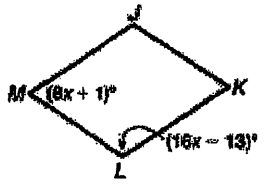


a) m∠1 = 54°, find m∠2.

b) If XT = 2y – 3 and US = 32, solve for y.

21.

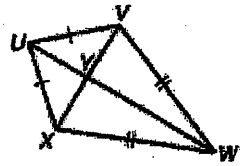
In $\square JKLM$, what is the value of $m\angle K$?



F 15°
H 65°
G 57°
J 115°

22.

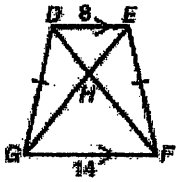
In kite $UVWX$, $m\angle XUV = 84°$, and $m\angle WVX = 68°$. What is $m\angle VWX$?



F 22°
H 44°
G 42°
J 45°

23.

$GE = 5x + 2$ and $DF = 8x - 7$.
What is GE?



A 16
B 17
C 18
D 19

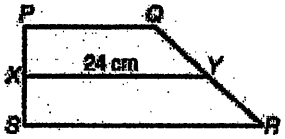
24.

What additional information would allow you to conclude that $JKLM$ is a rhombus?

F $\overline{JK} \parallel \overline{ML}$ and $\overline{JM} \parallel \overline{KL}$.
G $\overline{JM} \cong \overline{JK}$
H $\overline{JL}$ and $\overline{MK}$ bisect each other.
J $\overline{JL} \cong \overline{MK}$

25.

In trapezoid $PQRS$, if $\overline{YX}$ is the midsegment, what could be the lengths of $\overline{PQ}$ and $\overline{SR}$?



F 4 cm and 8 cm
G 9 cm and 15 cm
H 17 cm and 31 cm
J 18 m and 30 m

26.

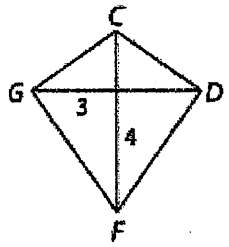
Which is the best name for the quadrilateral with vertices at (2, 2), (5, −2), (1, −5), and (−2, −1)?

A parallelogram
C rhombus
B rectangle
D square

If *CDFG* is a kite, find each measure.

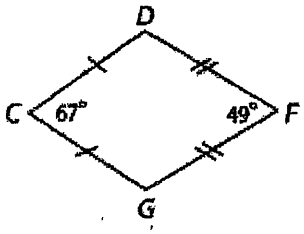
27.

GF



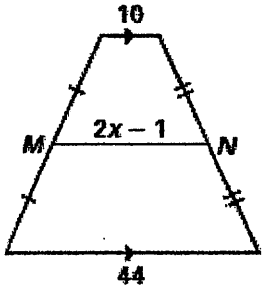
28.

$m\angle D$

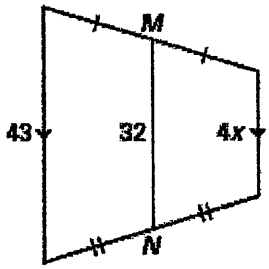


Find the value of x:

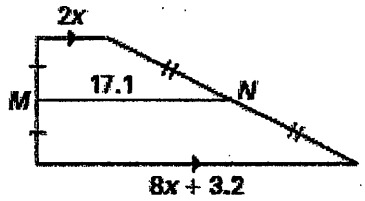
29.



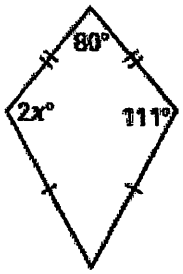
30.



31.



32.



WXYZ is a square. If $WT = 3$, find each measure.

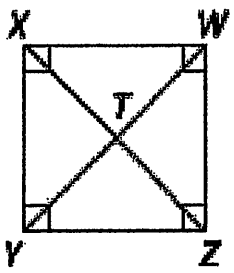
33.

a) $m\angle WYX =$ _____

b) YZ = _____

c) $m\angle WTZ =$ _____

d) XZ = _____



CCGPS Analytic Geometry Probability Test Review 2

1. The math club is electing new officers. There are 4 candidates for president, 5 candidates for vice-president, 2 candidates for secretary, and 1 candidate for treasurer. How many different combinations of officers are possible?

2. A piggybank contains 2 quarters, 3 dimes, 4 nickels, and 5 pennies. One coin is removed at random.

   a) What is the probability that the coin is a dime?

   b) What is the probability that the coin is a dime **or** a nickel?

   c) What is the probability that you choose a nickel **and** then a nickel? (without replacement)

   d) What is the probability that the coin is not a quarter?

3. Each of the letters of the word "ALGEBRA " is on a separate card. The cards have been mixed and placed in a box. If you select one card at random, what is the probability that its letter will be "A"?

4. A card is randomly selected from a standard deck of 52 cards. Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

   a) P(Face card)

   b) P(Ace or a Diamond)

   c) P(Black and Ace)

   d) P(Black card or Face card)

5. Two cards are randomly selected from a standard deck of 52 cards (WITH REPLACEMENT). Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

a) P(Jack and Heart)

b) P(Diamond and Diamond and Diamond)

c) P(Red and King)

d) P(Black card and Numbered card)

6. Two cards are randomly selected from a standard deck of 52 cards (**WITHOUT** REPLACEMENT). Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

a) P(Jack of Hearts and Heart)

b) P(Face card and Face card and Ace)

d) P(Black Card and Red King)

d) P(Black Jack and Numbered card)

7. The probability that a student plays tennis is 47%. The probability that a student plays tennis and Lacrosse is 16%. What is the probability that student plays Lacrosse, given that they play tennis?

8. The probability that a high school senior drives to school is .81. The probability that a high school senior having a job and driving to school is .52. What is the probability that high school senior will have a job, given that they drive to school?

For #9 - 13, refer to the following table.

	Male	Female	Subtotal
Blue Eyes	40	20	
Green Eyes	10	80	
Subtotal			

9) P (Male) =

10. P (Green Eyes) =

11.P(Green Eyes | Male) =

12. P(Male | Green Eyes) =

1. A deli has a lunch special which consists of a sandwich, soup, dessert and drink for $4.99. They offer the following choices: **Sandwich**: chicken salad, ham, and tuna, and roast beef **Soup**: tomato, chicken noodle, vegetable **Dessert**: cookie and pie **Drink**: tea, coffee, coke, diet coke and sprite. How many lunch specials are there?

2.

In a bag there are 3 red marbles, 2 yellow marbles, and 1 blue marble. After a marble is selected, it is replaced. Using this new situation, find the probability of each outcome listed above.

a) a red marble and then a yellow marble

b) a blue marble and then a yellow marble

c) a red marble and then a blue marble

d) any color marble except yellow and then a yellow marble

e) a red marble three times in a row

f) A red marble or a blue marble

3. In a bag there are 4 red marbles, 2 yellow, and 5 blue marbles. After a marble is selected, it is **NOT** replaced. Find the probability of each outcome below:

a. a red marble and then a yellow marble

b a blue marble and then a yellow marble

c a red marble and then a blue marble

d any color marble except yellow and then a yellow marble

e a red marble three times in a row

4. Each of the letters of the word "GEOMETRY " is on a separate card. The cards have been mixed and placed in a box. If you select one card at random, what is the probability that its letter will be "E or a consonant"?

5. A card is randomly selected from a standard deck of 52 cards. Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards, **16 odd numbered cards, 20 even numbered cards** **

a) P(Face cards or Odd numbered cards) b) P(Face card and Spades)

c) P(Red or Face Cards) d) P(Diamonds or even cards)

6. Two cards are randomly selected from a standard deck of 52 cards (WITH REPLACEMENT). Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards, **16 odd numbered cards, 20 even numbered cards** .**

a) P(Face cards and Odd numbered cards) b) P(Face card and Spades)

c. P(Red and Face Cards) d) P(even card 3 times)

7) Two cards are randomly selected from a standard deck of 52 cards (~~WITHOUT~~ REPLACEMENT). Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.** **16 odd numbered cards, 20 even numbered cards**

a. P(Face cards and Odd numbered cards) b) P(Spades Face card and Spades)

(c) P(Hearts Face Cards and Red) d) P(even card 3 times)

8) The probability that a student plays tennis is 56%.. The probability that a student plays tennis and Lacrosse is 26%. What is the probability that student plays Lacrosse, given that they play tennis?

For #9 - 12, refer to the following table.

	Male	Female	Subtotal
Blue Eyes	40	20	
Green Eyes	10	80	
Subtotal			

9) P (Female) =

10. P (Green Eyes) =

11.P(Green Eyes | Female) = 12. P(Female | Green Eyes) =

13. Are Green eyes and Female independent or dependent?