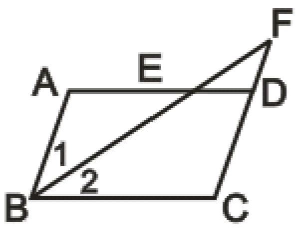
>

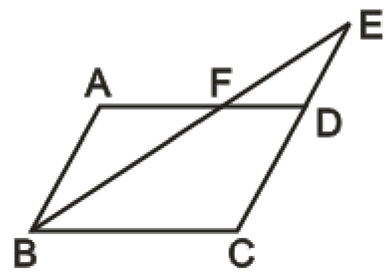
Name ______________________________

Date ____________________
(Key 1 - Answer ID # 0173240)

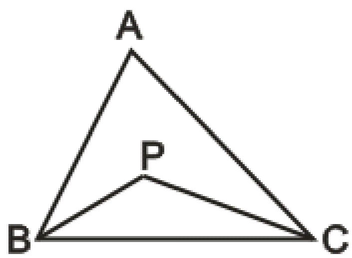
1. In ▱ABCD, m∠1 = m∠2, CF = 15 cm, AB = 10 cm, and m∠C = 105°. Find the perimeter of ▱ABCD.



2. Given: Parallelogram ABCD with $\overline{CD}$ extended to E
Prove: $\overline{AB} \times \overline{EF} \cong \overline{BF} \times \overline{DE}$



3. $\overline{BP}$ and $\overline{CP}$ are angle bisectors. If m∠A = 72°, find the measure of ∠BPC.



4. In △ABC, the measure of angle B is twice the measure of angle A. Angle C measures three times the measure of angle A. If AC = 22, find AB.

(A) 11
(B) $22\sqrt{3}$
(C) 22
(D) $11\sqrt{2}$
(E) $11\sqrt{3}$

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5. The diagonals of a ______ are perpendicular bisectors of each other.

(A) trapezoid
(B) rectangle
(C) rhombus
(D) parallelogram

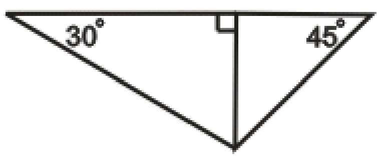
6. In right $\triangle ABC$, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$. If AC = 26 and AD = 13, find AB.

(A) $2\sqrt{13}$
(B) $13\sqrt{2}$
(C) 2 2
(D) 52
(E) 39

7. The measure of inscribed $\angle ABC = 69°$. Find $m\overset{\frown}{AC}$.

8. How many degrees are in each angle of an equilateral triangle?

9. If the length of the hypotenuse of the right isosceles triangle is 8, find the length of the longer leg of the adjacent triangle.



10. In $\square ABCD$, $\angle B : \angle C = 1:3$. Find the measure of $\angle A$.

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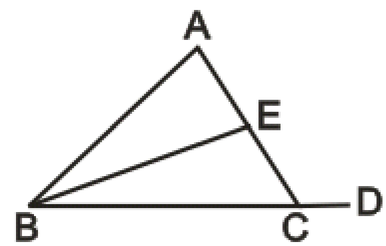
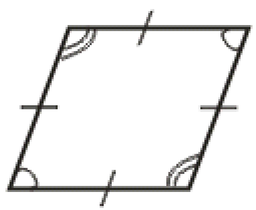
11. The governor wants to build a new library for three cities X, Y, and Z. If the distance between each two cities is 18 kilometers, and the location of the new library will be in equidistance to all three cities, what is the distance between the new library and city X?

12. Given: $\overline{BE}$ bisects $\angle$ABC.

Prove: $\angle$ACD > $\angle$ABE

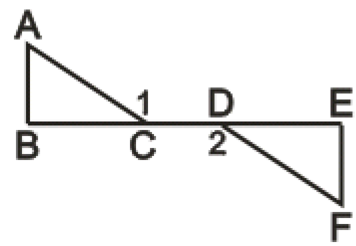


13. State whether the polygon is best described as equiangular, equilateral, regular, or none of these.



14. Given: $\angle 1 \cong \angle 2$, $\overline{BD} \cong \overline{CE}$, $\overline{AB} \perp \overline{BE}$, $\overline{EF} \perp \overline{BE}$

Prove: $\angle A \cong \angle F$



15. Points X and Y are on $\overline{AB}$. If AX > BY, then which statement must be true?

(A) XY < BY
(B) AY < BY
(C) AY + BX > AB
(D) AX < BX
(E) AY > BX

16. Suppose that the vertex, O, of $\angle$AOB is placed on the center point of a half-circle with coordinates from 0° to 180°. Let a and b be the coordinates where $\overrightarrow{OA}$ and $\overrightarrow{OB}$ intersect the half circle. What is the measure of $\angle$AOB?

(A) a - b
(B) |b - a|
(C) a + b
(D) ab

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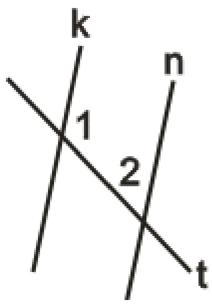
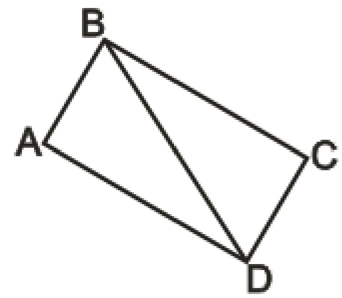
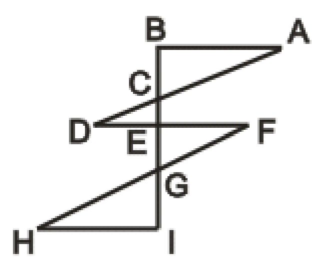
17. Transversal t cuts lines k and n. $m\angle 1 = (148 - 3x)^\circ$ and $m\angle 2 = (5x + 12)^\circ$. Find the value of x that makes $k \parallel n$. 	18. Given: $\overline{AB} \cong \overline{DC}$, $\overline{AB} \perp \overline{AD}$, $\overline{DC} \perp \overline{BC}$ Prove: $\overline{AD} \cong \overline{BC}$ 
19. At 5 o'clock the hands of a clock form an angle of ______.	20. The length of the hypotenuse of a right isosceles triangle is $4\sqrt{5}$. What is the perimeter of the triangle?
21. Three lines intersecting in one point are ______ coplanar. (A) sometimes (B) never (C) always	22. $\overline{AB} \parallel \overline{HI} \parallel \overline{DF}$, $\overline{AD} \parallel \overline{FH}$, $\overline{BI} \perp \overline{HI}$, and $m\angle H = 21^\circ$. Find $m\angle BCA$. 

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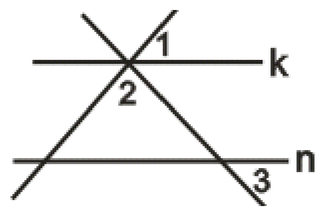
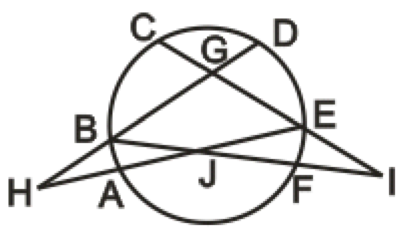
(Key 2 - Answer ID # 0903204)

1. Which of the following equations are proportions?
   - (A) 43/75 ? 68/100
   - (B) 8/6 ? 28/21
   - (C) 4/15 ? 6/21.5
   - (D) 1/6 ? 18/3

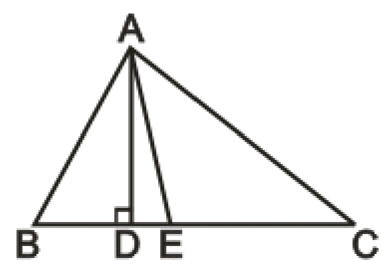
2. If $k \parallel n$, $m\angle 1 = (3x - 11)^\circ$, $m\angle 2 = 3x^\circ$, and $m\angle 3 = (x + 44)^\circ$, find the value of x.



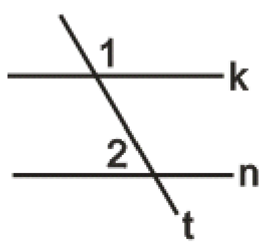
3. In the figure, A, B, C, D, E, and F are points on a circle, $m\angle H = 16^\circ$, and $m\angle I = 23^\circ$. Find $m\angle BGC - m\angle EJF$.



4. In $\triangle ABC$, $\overline{AD} \perp \overline{BC}$ and $\overline{AE}$ bisects $\angle BAC$, $m\angle B = 62^\circ$, and $m\angle C = 36^\circ$. Find $m\angle DAE$.

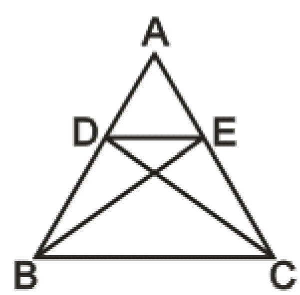


5. $m\angle 1 = (x^2)^\circ$ and $m\angle 2 = (2x - 15\ )^\circ$. Find the value of x that makes lines k and n parallel.



6. Given: $\overline{BD} \cong \overline{CE}$, $\overline{AD} \cong \overline{AE}$

   Prove: $\angle BCD \cong \angle CBE$



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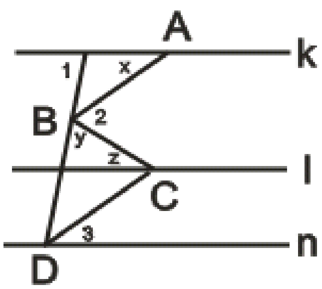
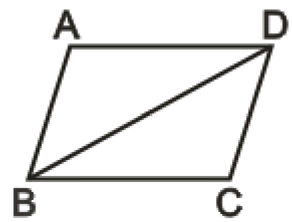
7. $k \parallel l \parallel n$ and $\overline{AB} \parallel \overline{CD}$. If $m\angle 1 = 75°$, $m\angle 2 = 63°$, and $m\angle 3 = 38°$, then $m\angle x + m\angle y + m\angle z$ = ______.



8. Given: $m\angle ABD = (2x + 9y + 78)°$, $m\angle CBD = (4x + y + 52)°$, $m\angle ADB = (x + 8y + 58)°$ and $m\angle CDB = (2x + 4y + 63)°$. What values must x and y have to make the quadrilateral a parallelogram?



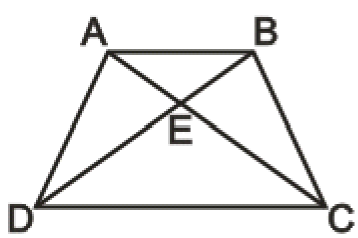
9. In right $\triangle ABC$, altitude $\overline{CD}$ is drawn to the hypotenuse. If AD = 8, BD = 18, and CD = x + 9, find the length of the altitude.

10. E is the midpoint of $\overline{DF}$. If DE = 3x + 33 and EF = 7x + 13, then DF = ______.

11.

Given: $\overline{BD}$ bisects $\angle ADC$. $\overline{AC}$ bisects $\angle BCD$. $\angle ADC \cong \angle BCD$

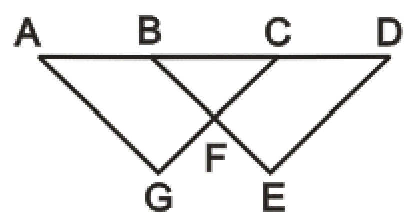
Prove: $\overline{AD} \cong \overline{BC}$



12.

Given: $\overline{AG} \parallel \overline{BE}$, $\overline{CG} \parallel \overline{DE}$, $\overline{AB} \cong \overline{CD}$

Prove: $\angle G \cong \angle E$



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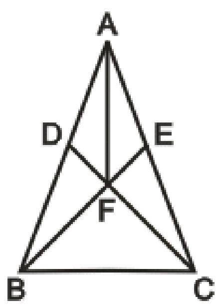
(Key 2 - Answer ID # 0903204)

13. In rectangle ABCD, AB=(2x + 5y - 117), BC=(4x + 2y - 102), CD=(3x - 7y + 78), and DA=(7x + 2y - 165). Find the perimeter of the rectangle.

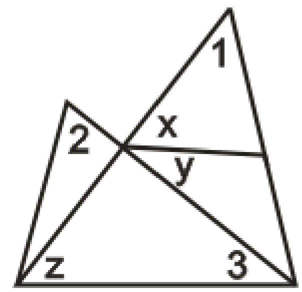
14. In $\triangle$ABC, $\overline{AB} \cong \overline{AC}$, m$\angle$A=(x + 74)° and m$\angle$B=(x + 47)°. Find all three angles.

15. If $\overline{AB} \cong \overline{AC}$ and $\overline{AD} \cong \overline{AE}$, how many pairs of congruent triangles are there in the figure?



(A) 6
(B) 5
(C) 4
(D) 3

16. If m$\angle$1 = 51°, m$\angle$2 = 69°, and m$\angle$3 = 42°, then m$\angle$x + m$\angle$y - m$\angle$z = ______.



17. In right $\triangle$ABC, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$. Which line segment is NOT a hypotenuse?

(A) $\overline{CD}$
(B) $\overline{BC}$
(C) $\overline{AB}$
(D) $\overline{AC}$

18. In right triangle ABC, the length of leg BC is $6\sqrt{3}$. If the area of the triangle is $54\sqrt{3}$, find the measure of $\angle$A.

(A) 30°
(B) 45°
(C) 60°
(D) 90°

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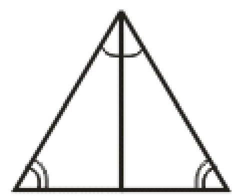
19. ABCD is a rectangle with diagonals intersecting at E. Given that AB = 12 and BC = 5, find the length of $\overline{DE}$.

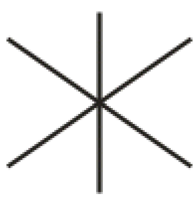
20. In ▱ABCD, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E. If $m\angle ACB=(2x + 1)^\circ$, $m\angle ADB=(4x + 6)^\circ$, $m\angle AED=107^\circ$, find the value of x.

21. What happens if the triangles share a side, part of a side, or part of an angle?

22. State whether or not each of the following triangle pairs is congruent. If so, state a reason.



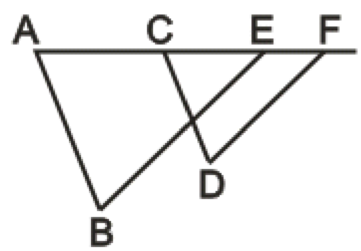
23. State whether the figure is a polygon. If it is, identify the polygon and state whether it is convex or concave. If it is not, explain why.



24.

Given: $\overline{AB} \parallel \overline{CD}$, $\overline{BE} \parallel \overline{DF}$

Prove: $\overline{BE} \times \overline{CF} \cong \overline{DF} \times \overline{AE}$



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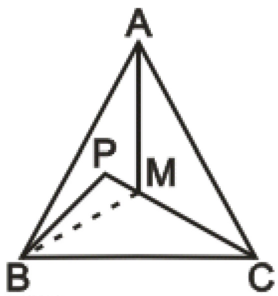
(Key 3 - Answer ID # 0496849)

1. Michael had a geometry quiz today. He answered all questions correctly except for one:

In $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, P is a point inside the triangle, and $\overline{AM}$ bisects $\angle A$ and meets $\overline{PC}$ at M. Prove $\overline{PC} > \overline{PB}$. Michael showed you his steps for his proof. Please tell Michael which step was wrong?



(A) $\because \angle BAM \cong \angle CAM$, $\overline{AM} \cong \overline{AM}$

(B) $\therefore \triangle AMB \cong \triangle AMC$ by SAS

(C) $\therefore \overline{MB} \cong \overline{MC}$

(D) In $\triangle BPM$, $\because \overline{PM} \perp \overline{PB}$

(E) $\therefore \overline{PM} + \overline{MC} > \overline{BP}$, $\overline{PC} > \overline{PB}$

2. Which of the following equations is NOT equivalent to $\frac{a}{b}=\frac{c}{d}$ = ab?

(A) $\frac{x+y}{z-y} = \frac{z}{x-y}$

(B) $\frac{b}{a}=\frac{d}{c} = \frac{x+y}{z}$

(C) $\frac{2y}{x+z} = \frac{p}{q}=\frac{x}{y}\frac{p}{q}=\frac{r}{s}$

(D) $cd = \frac{a+b}{b}=\frac{c+d}{d}$

(E) $\frac{d}{b}=\frac{c}{a} = \frac{a^2}{b^2}=\left(\frac{c}{d}\right)^2$

3. In $\triangle XYZ$, $\overline{YX}$ is extended through X to W and $\overline{XZ} \cong \overline{XY}$. $m\angle WXZ=(4x - 18)^\circ$ and $m\angle Y=(x + 5)^\circ$. Find x.

4. $\odot P$ and $\odot Q$ are congruent circles that intersect at C and D. What kind of quadrilateral must PCQD be?

(A) a square

(B) a rhombus

(C) a trapezoid

(D) a parallelogram

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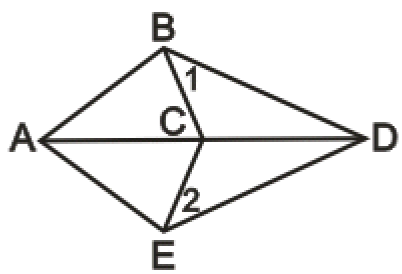
(Key 3 - Answer ID # 0496849)

5.

Given: $\overline{AB} \cong \overline{AE}$, $\overline{BC} \cong \overline{EC}$

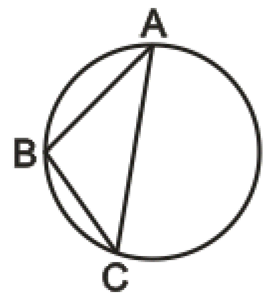
Prove: $\angle 1 \cong \angle 2$



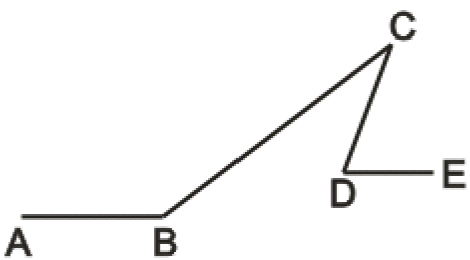
6.

Given: $\angle B > \angle C$

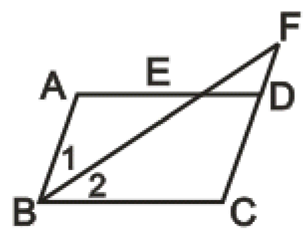
Prove: $\overparen{ACB} > \overparen{ABC}$



7. If $\overline{AB} \parallel \overline{DE}$, $m\angle ABC = 2(m\angle CDE)$, and $m\angle BCD = 30°$, then $m\angle CDE$ = ______.



8. In ▱ABCD, $m\angle 1 = m\angle 2$, CF = 15 cm, AB = 11 cm, and $m\angle C = 95°$. Find the perimeter of ▱ABCD.



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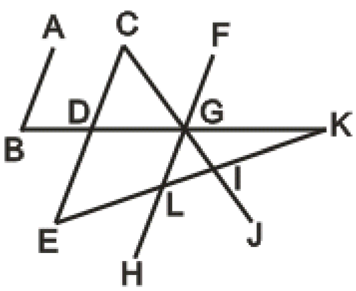
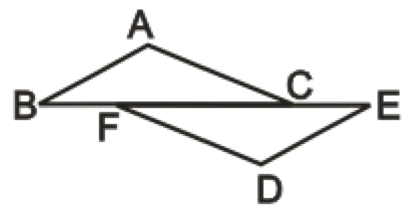
(Key 3 - Answer ID # 0496849)

9. $\overline{AB} \parallel \overline{CE} \parallel \overline{FH}$, $m\angle B = 70°$, $m\angle K = 21°$, and $\overline{CJ}$ bisects $\angle BGF$. Find $m\angle E$ and $m\angle FGK$.



10. Given: $\angle A \cong \angle D$, $\angle B \cong \angle E$, and $\overline{BF} \cong \overline{CE}$. If $\triangle ABC$ can be proven congruent to $\triangle DEF$, state the congruency postulate involved.

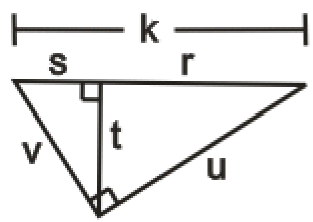


11. Why doesn't CPCTC guarantee that triangles are equilateral and/or equiangular?

12. ABCD is a rectangle with diagonals intersecting at E. Given that AB = 8 and BC = 6, find the length of $\overline{DE}$.

13. State whether the polygon is best described as equiangular, equilateral, regular, or none of these.

14. Which of the following statements is NOT true?



(A) If $sr = 8t$ and $k = 24$, then $s^2 + t^2 = 568$.

(B) If $s = 4$ and $r = 10$, then $t = 2\sqrt{10}$.

(C) If $s = 4$ and $k = 15$, then $u = \sqrt{165}$.

(D) If $s = 4$ and $t = 6$, then $k = 13$.

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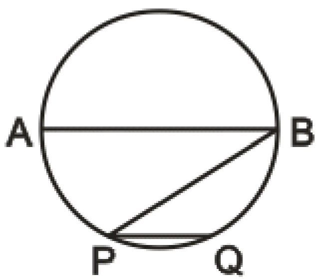
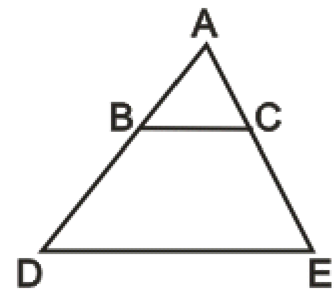
(Key 3 - Answer ID # 0496849)

15. Diameter $\overline{AB}$ is parallel to chord $\overline{PQ}$. If the measure of arc BQ is twice of that of arc PQ, find the measure of angle ABP.



16. Given: $\overline{BC} \parallel \overline{DE}$

Prove: $\overline{AB} \times \overline{DE} \cong \overline{AD} \times \overline{BC}$



17. Plane X is parallel to plane Y. If plane Z intersects X in line k and Y in line n, then k is ______ parallel to n.

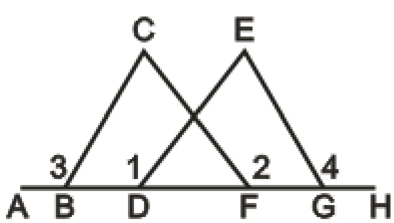
Ⓐ always
Ⓑ never
Ⓒ sometimes

18. In circle O, secant $\overline{ABC}$ and chord $\overline{BD}$ intersect. If m$\widehat{AD}$ = 188° and m$\widehat{BD}$ = 59 °, find m$\angle$CBD.

19.

Given: $\angle 1 \cong \angle 2$, $\angle 3 \cong \angle 4$, $\overline{BD} \cong \overline{FG}$

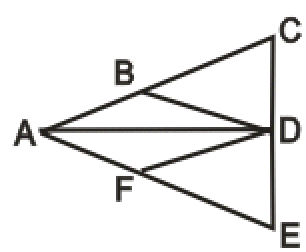
Prove: $\angle C \cong \angle E$



20.

Given: $\overline{AB} \cong \overline{AF}$, $\overline{AC} \cong \overline{AE}$, D is the midpoint of $\overline{CE}$.

Prove: $\angle BDA \cong \angle FDA$



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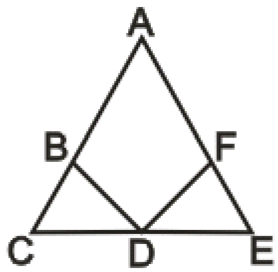
(Key 4 - Answer ID # 0756486)

1.

Given: D is the midpoint of $\overline{CE}$. $\overline{AC} \cong \overline{AE}$, $\overline{AB} \cong \overline{AF}$, $\angle C \cong \angle E$

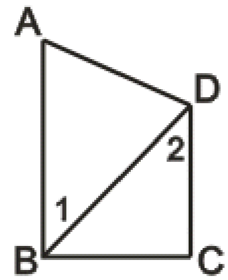
Prove: $\overline{BD} \cong \overline{FD}$



2.

Given: $\overline{AB} \perp \overline{BC}$, $\angle 1 \cong \angle 2$

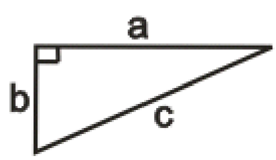
Prove: $\overline{DC} \perp \overline{BC}$



3. What is the relationship between a central angle and an angle inscribed in the same arc?

4. The governor wants to build a new library for three cities X, Y, and Z. If the distance between each two cities is 12 kilometers, and the location of the new library will be in equidistance to all three cities, what is the distance between the new library and city X?

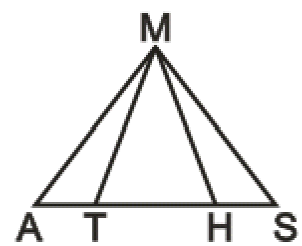
5. If a = 13 and b = 10, find c.



6.

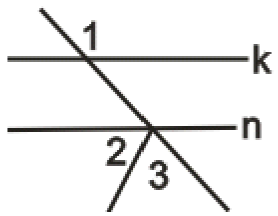
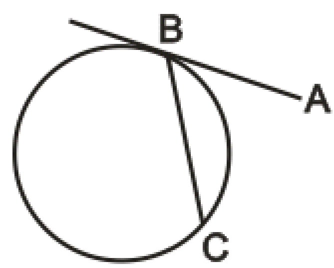
Given: $\overline{AT} \cong \overline{HS}$, $\overline{MT} \cong \overline{MH}$

Prove: $\triangle$AMS is isosceles.



Name ______________________________ Date ____________________

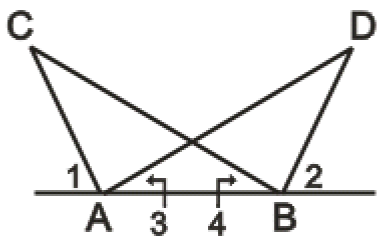
(Key 4 - Answer ID # 0756486)

7. m∠1 = 135°, m∠2 = 63°, m∠3 = 77°. Is k ∥n? If so, explain how. 	8. Suppose the ratio of the side lengths of a regular hexagon ABCDEF to the corresponding side lengths of another regular hexagon A'B'C'D'E'F' are $\sqrt{3}$:1. If the area of hexagon ABCDEF is x and the area of hexagon A'B'C'D'E'F' is x', then x:x' = ______. (A) $\sqrt{3}:1$ (B) 3:1 (C) $\sqrt{2}:1$ (D) 2:1
9. ABCD is a rhombus. If AB=(8x - 104), CD=(10x - 130), find the value of x.	10. Why does an equilateral triangle have to be equiangular?
11. Does CPCTC prove triangles congruent? Why or why not?	12. Tangent $\overline{AB}$ and chord $\overline{BC}$ are drawn to circle O. The measure of major $\overset{\frown}{BC}$ is $(6x + 167)^\circ$ and the measure of minor $\overset{\frown}{BC}$ is $(4x - 87)^\circ$. Find m∠ABC. 

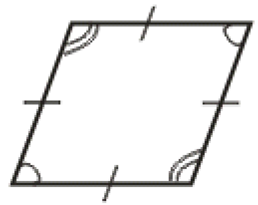
Name ______________________________ Date ____________________

(Key 4 - Answer ID # 0756486)

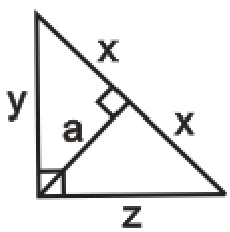
13. Given: $\angle 1 \cong \angle 2$ and $\angle 3 \cong m\angle 4$. Prove $\overline{AD} \cong \overline{BC}$.



14. State whether the polygon is best described as equiangular, equilateral, regular, or none of these.

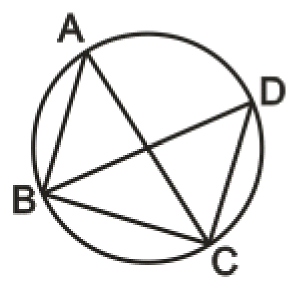


15. If a = 100, find the value of x, y, and z.

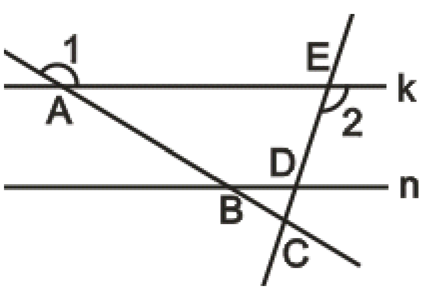


16. Given: $\overset{\frown}{AB} \cong \overset{\frown}{CD}$

Prove: $\angle ABC \cong \angle DCB$

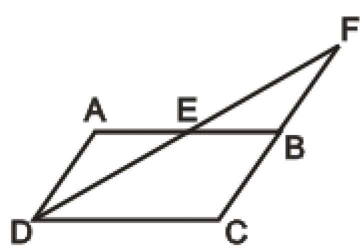


17. If $k \parallel n$, $m\angle 1 = 130°$, and $m\angle 2 = 102°$, find the measure of $\angle ACE$.



18. Given: B is the midpoint of $\overline{FC}$. $\overline{AB}$ and $\overline{FD}$ bisect each other. $\overline{AD} \cong \overline{BC}$

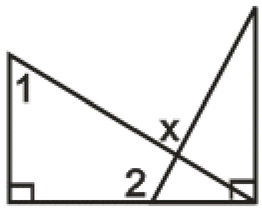
Prove: $\angle ADF \cong \angle F$



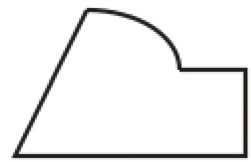
Name ______________________________ Date ____________________

(Key 4 - Answer ID # 0756486)

19. If m∠1 = 53°, and m∠2 = 114°, then m∠x = ______.



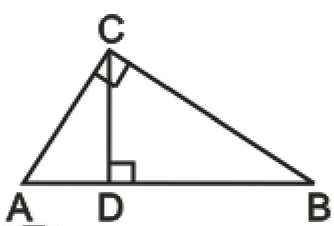
20. State whether the figure is a polygon. If it is, identify the polygon and state whether it is convex or concave. If it is not, explain why.



21. ⊙P and ⊙Q are congruent circles that intersect at C and D. If the radius is 13 cm and PQ = 12 cm, what is the area of quadrilateral PCQD?

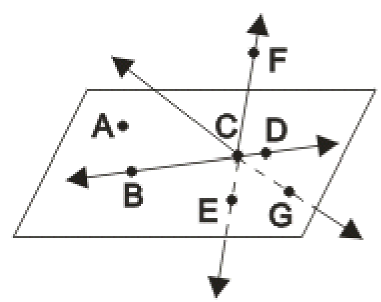
22. E is the midpoint of $\overline{DF}$. If DE = 3x + 6 and EF = 51, find the value of x.

23. In △ABC, AD = 8 and DB = 24. Find AC.



(A) $8\sqrt{3}$
(B) $4\sqrt{2}$
(C) $16\sqrt{3}$
(D) 16
(E) 4

24. Points E, F, and G are ______.



(A) collinear
(B) noncoplanar
(C) noncollinear
(D) coplanar

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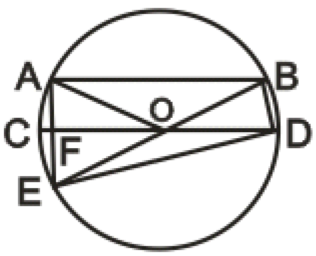
(Key 5 - Answer ID # 0939992)

1. The perimeter of a triangle is 135 cm and the lengths of its sides are in the ratio 10 :7:10. Find the length of each side.

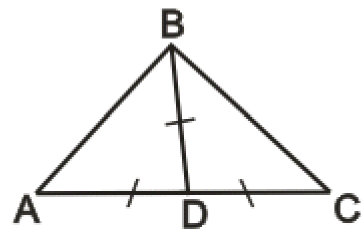
2. Does AAA guarantee that two triangles are congruent? Why or why not?

3. In circle O, chord $\overline{AB}$ is parallel to diameter $\overline{CD}$. If m$\overset{\frown}{AB}$ = 4m$\overset{\frown}{AC}$, find (a) m$\overset{\frown}{AC}$ (b) m$\angle$AOB (c) m$\angle$AEB (d) m$\angle$AFC (e) m$\angle$BDE.



ANSWERS:

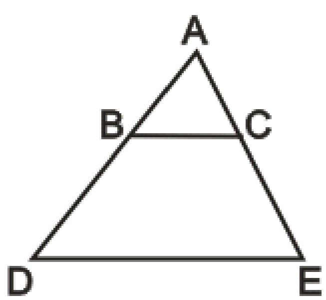
4. If m$\angle$A = 38°, find m$\angle$ABC.



5.

Given: $\overline{BC} \parallel \overline{DE}$

Prove: $\overline{AB} \times \overline{DE} \cong \overline{AD} \times \overline{BC}$



6. When two secants are drawn from an external point to the same circle, the measurement of one particular arc will enable you to find the measure of the angle formed by the secants.

(A) False

(B) True

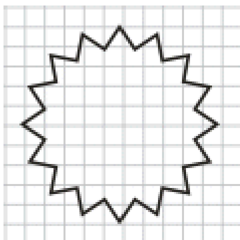
Name ______________________________ Date ____________________

(Key 5 - Answer ID # 0939992)

7. Suppose M is between L and N. LM = 5x - 19, MN = 2x - 9, LN = 11x - 60. Find the value of the variable and the lengths of $\overline{LM}$, $\overline{MN}$, and $\overline{LN}$.

8. The coordinates of a parallelogram are (1, -1), (3, 2), (9, 0), and (x, y) and x > 9. What is the value of x + y?

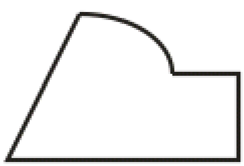
9. State whether the polygon is best described as equiangular, equilateral, regular, or none of these.



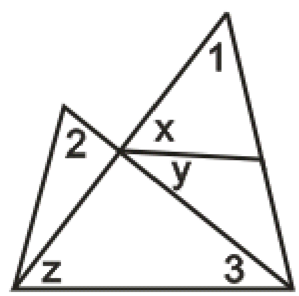
10. Suppose there are n non-collinear points in the interior of ∠XYZ. How many pairs of adjacent angles are in ∠XYZ?

A n - 1
B n + 1
C 2n
D n(n + 1)
E n

11. State whether the figure is a polygon. If it is, identify the polygon and state whether it is convex or concave. If it is not, explain why.



12. If m∠1 = 51°, m∠2 = 68°, and m∠3 = 39°, then m∠x + m∠y - m∠z = ______.



13. Draw a circle O with radius 12. Then draw radii $\overline{OA}$ and $\overline{OB}$ to form an angle of 60 degrees. What is the length of $\overline{AB}$?

14. Secants $\overline{ABC}$ and $\overline{EDC}$ are drawn to circle O. If m$\overset{\frown}{AE}$ = 151° and m$\overset{\frown}{BD}$ = 42°, find m∠C.

Name ______________________________ Date ____________________

(Key 5 - Answer ID # 0939992)

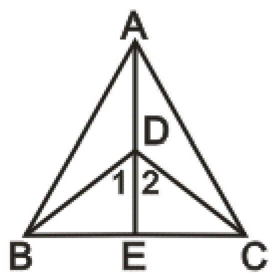
15. ABCD is a rectangle with diagonals intersecting at E. Given that AB = 12 and BC = 6, find the length of $\overline{DE}$.

16. A rectangle has a diagonal of 10 and length of $2\sqrt{6}$. Find the area of the rectangle.

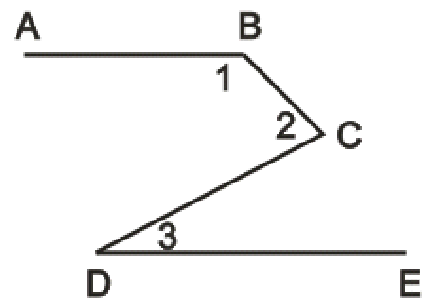
17.

Given: $\overline{AE}$ bisects $\angle$BAC. $\overline{AB} \cong \overline{AC}$

Prove: $\angle 1 \cong \angle 2$



18. If $\overline{AB} \parallel \overline{DE}$, m$\angle$1 = 140°, and m$\angle$2 = 79°, then m$\angle$3 = ______.

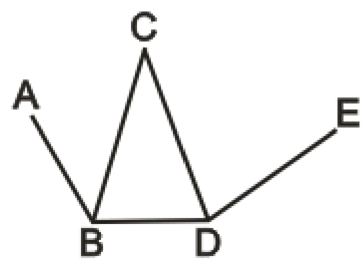


19. Name the properties of a rhombus.

20.

Given: $\angle$EDB > $\angle$ABD, $\overline{CB} \cong \overline{CD}$

Prove: $\angle$CDB > $\angle$ABC



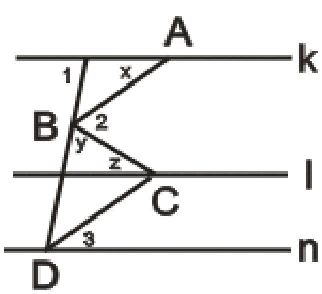
Name ______________________________ Date ____________________

(Key 5 - Answer ID # 0939992)

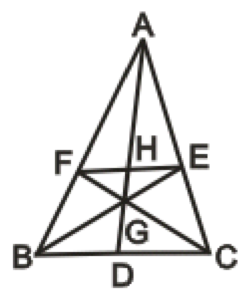
21. How many degrees are in each acute angle of an isosceles right triangle?

22. Seven $45°$-$45°$-$90°$ triangles share one vertex. The hypotenuse of one triangle is the leg of the neighboring triangle. If the length of the hypotenuse of the first (also the smallest) triangle is r, express the length of the hypotenuse of the seventh triangle in terms of r.

23. $k \parallel l \parallel n$ and $\overline{AB} \parallel \overline{CD}$. If $m\angle 1 = 79°$, $m\angle 2 = 64°$, and $m\angle 3 = 33°$, then $m\angle x + m\angle y + m\angle z$ = ______.



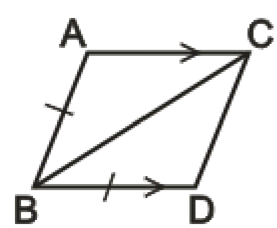
24. Medians $\overline{AD}$, $\overline{BE}$, and $\overline{CF}$ of $\triangle$ABC meet at G, $\overline{EF}$ intersects $\overline{AD}$ at H, and $\overline{AD}$ = 21. Find $\overline{GH}$.



25. In $\triangle$ABC, the measure of angle B is twice the measure of angle A. Angle C measures three times the measure of angle A. If AC = 38, find AB.

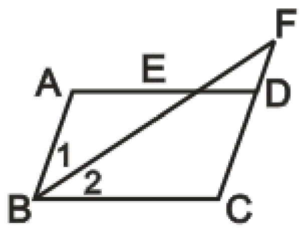
- (A) $38\sqrt{3}$
- (B) $19\sqrt{2}$
- (C) 38
- (D) 19
- (E) $19\sqrt{3}$

26. Is $\triangle$ABC $\cong$ $\triangle$DBC? If so, name the postulate or theorem used.



Answer Key 0173240
Key # 1

1. In ▱ABCD, m∠1 = m∠2, CF = 15 cm, AB = 10 cm, and m∠C = 105°. Find the perimeter of ▱ABCD.

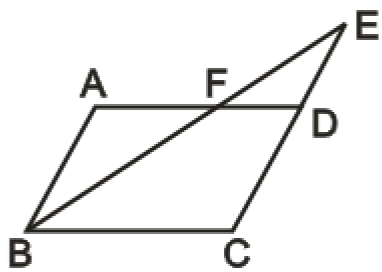


50 cm

2.

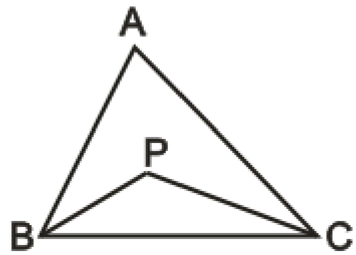
Given: Parallelogram ABCD with $\overline{CD}$ extended to E

Prove: $\overline{AB} \times \overline{EF} \cong \overline{BF} \times \overline{DE}$



Statements	Reasons
1. Parallelogram ABCD	1. Given
2. $\overline{AB} \parallel \overline{CDE}$	2. Opposite sides of a parallelogram are parallel.
3. ∠ABF ≅ ∠E	3. Parallel lines cut by a transversal form congruent alternate interior angles.
4. ∠AFB ≅ ∠DFE	4. Vertical angles are congruent
5. △ABF ~ △DEF	5. AA
6. $\frac{\overline{AB}}{\overline{BF}} \cong \frac{\overline{DE}}{\overline{EF}}$	6. Similar triangles have corresponding sides in proportion.
7. $\overline{AB} \times \overline{EF} \cong \overline{BF} \times \overline{DE}$	7. The product of the means equals the product of the extremes.

3. $\overline{BP}$ and $\overline{CP}$ are angle bisectors. If m∠A = 72°, find the measure of ∠BPC.



126°

4. In △ABC, the measure of angle B is twice the measure of angle A. Angle C measures three times the measure of angle A. If AC = 22, find AB.

(A) 11
(B) $22\sqrt{3}$
(C) 22
(D) $11\sqrt{2}$
● $11\sqrt{3}$

Answer Key 0173240
Key # 1

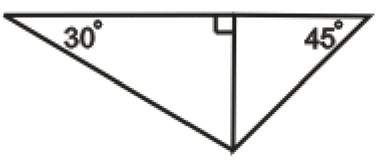
5. The diagonals of a ______ are perpendicular bisectors of each other.
   (A) trapezoid
   (B) rectangle
   ● rhombus
   (D) parallelogram

6. In right △ABC, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$. If AC = 26 and AD = 13, find AB.
   (A) $2\sqrt{13}$
   (B) $13\sqrt{2}$
   (C) 2 2
   ● 52
   (E) 39

7. The measure of inscribed ∠ABC = 69°. Find m$\overset{\frown}{AC}$.
   138°

8. How many degrees are in each angle of an equilateral triangle?
   60°

9. If the length of the hypotenuse of the right isosceles triangle is 8, find the length of the longer leg of the adjacent triangle.



   $4\sqrt{6}$

10. In ▱ABCD, ∠B:∠C=1:3. Find the measure of ∠A.
    135°

Answer Key 0173240
Key # 1

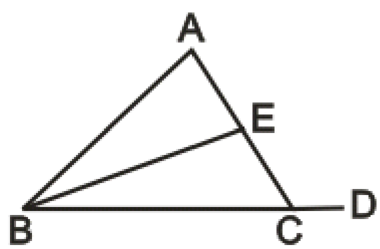
11. The governor wants to build a new library for three cities X, Y, and Z. If the distance between each two cities is 18 kilometers, and the location of the new library will be in equidistance to all three cities, what is the distance between the new library and city X?

$6\sqrt{3}$

12.

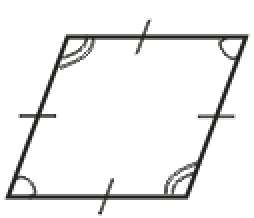
Given: $\overline{BE}$ bisects $\angle$ABC.

Prove: $\angle$ACD > $\angle$ABE



Statements	**Reasons**
1. $\overline{BE}$ bisects $\angle$ABC.	1. Given
2. $\angle$ABE $\cong$ $\angle$EBC	2. Definition of bisect
3. $\angle$ABC > $\angle$ABE	3. A whole angle is greater than any of its parts.
4. $\angle$ACD > $\angle$ABC	4. The exterior angle of a triangle is greater than either of the interior opposite angles.
5. $\angle$ACD > $\angle$ABE	5. Transitive property of inequalities

13. State whether the polygon is best described as equiangular, equilateral, regular, or none of these.

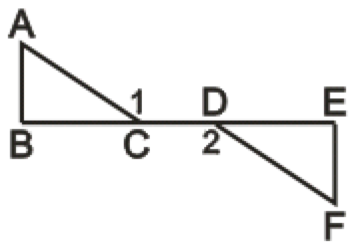


Quadrilateral; equilateral

14.

Given: $\angle 1 \cong \angle 2$, $\overline{BD} \cong \overline{CE}$, $\overline{AB} \perp \overline{BE}$, $\overline{EF} \perp \overline{BE}$

Prove: $\angle A \cong \angle F$



Statements	**Reasons**
1. $\angle 1 \cong \angle 2$	**1.** Given
2. $\angle 1$ and $\angle ACB$ are supplements. $\angle 2$ and $\angle FDE$ are supplements.	**2.** Definition of supplements
3. $\angle ACB \cong \angle FDE$	**3.** Supplements of congruent angles are congruent.
4. $\overline{AB} \perp \overline{BE}$, $\overline{EF} \perp \overline{BE}$	**4.** Given
5. $\angle B$ and $\angle E$ are right angles.	**5.** Definition of perpendicular
6. $\angle B \cong \angle E$	**6.** All right angles are congruent.
7. $\overline{BD} \cong \overline{CE}$	**7.** Given
8. $\overline{CD} \cong \overline{CD}$	**8.** Reflexive
9. $\overline{BD} - \overline{CD} \cong \overline{CE} - \overline{CD}$	**9.** Subtraction
10. $\overline{BC} \cong \overline{ED}$	**10.** Substitution
11. $\triangle ABC \cong \triangle FED$	**11.** ASA 12 $\angle A \cong \angle F$

15. Points X and Y are on $\overline{AB}$. If AX > BY, then which statement must be true?

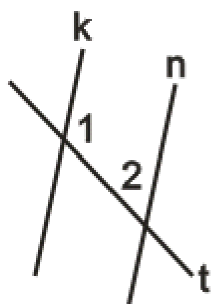
(A) XY < BY
(B) AY < BY
(C) AY + BX > AB
(D) AX < BX
(●) AY > BX

16. Suppose that the vertex, O, of $\angle AOB$ is placed on the center point of a half-circle with coordinates from 0° to 180°. Let a and b be the coordinates where $\overrightarrow{OA}$ and $\overrightarrow{OB}$ intersect the half circle. What is the measure of $\angle AOB$?

(A) a - b
(●) |b - a|
(C) a + b
(D) ab

Answer Key 0173240
Key # 1

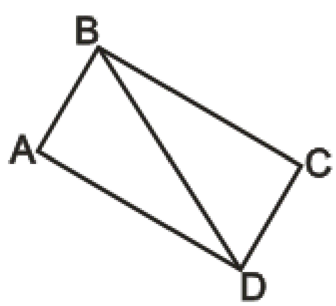
17. Transversal t cuts lines k and n. $m\angle 1 = (148 - 3x)^\circ$ and $m\angle 2 = (5x + 12)^\circ$. Find the value of x that makes $k \parallel n$.



10

18.
Given: $\overline{AB} \cong \overline{DC}$, $\overline{AB} \perp \overline{AD}$, $\overline{DC} \perp \overline{BC}$

Prove: $\overline{AD} \cong \overline{BC}$



Statements	Reasons
1. $\overline{AB} \perp \overline{AD}$, $\overline{DC} \perp \overline{BC}$	1. Given
2. $\angle$A and $\angle$C are right angles.	2. Definition of perpendicular
3. $\overline{AB} \cong \overline{DC}$	3. Given
4. $\overline{BD} \cong \overline{BD}$	4. Reflexive
5. $\triangle ABD \cong \triangle CDB$	5. HL
6. $\overline{AD} \cong \overline{BC}$	6. CPCTC

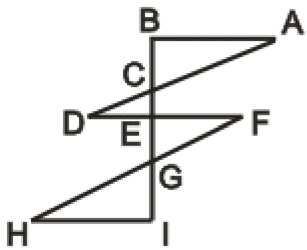
19. At 5 o'clock the hands of a clock form an angle of ______.
150°

20. The length of the hypotenuse of a right isosceles triangle is $4\sqrt{5}$. What is the perimeter of the triangle?
$4\sqrt{10} + 4\sqrt{5}$

21. Three lines intersecting in one point are ______ coplanar.
(A) sometimes
(B) never
(C)

always

22. $\overline{AB} \parallel \overline{HI} \parallel \overline{DF}$, $\overline{AD} \parallel \overline{FH}$, $\overline{BI} \perp \overline{HI}$, and m$\angle$H = 21°. Find m$\angle$BCA.

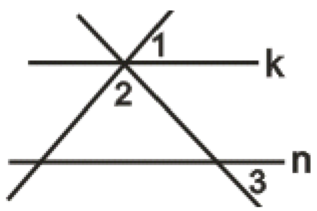


69°

Answer Key 0903204
Key # 2

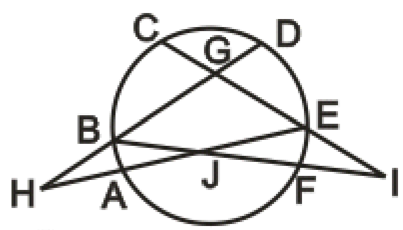
1. Which of the following equations are proportions?
   (A) 43/75 ? 68/100
   (B) 8/6 ? 28/21 ●
   (C) 4/15 ? 6/21.5
   (D) 1/6 ? 18/3

2. If k $\parallel$ n, m$\angle$1 = (3x - 11)°, m$\angle$2 = 3x°, and m$\angle$3 = (x + 44)°, find the value of x.



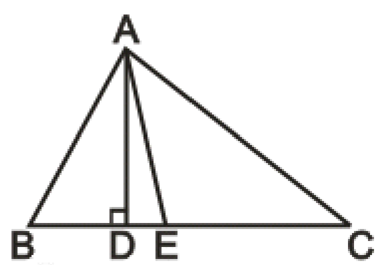
21

3. In the figure, A, B, C, D, E, and F are points on a circle, m$\angle$H = 16°, and m$\angle$I = 23°. Find m$\angle$BGC - m$\angle$EJF.



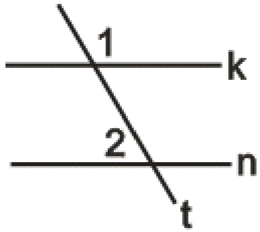
39°

4. In $\triangle$ABC, $\overline{AD} \perp \overline{BC}$ and $\overline{AE}$ bisects $\angle$BAC, m$\angle$B = 62°, and m$\angle$C = 36°. Find m$\angle$DAE.



13°

5. m$\angle$1 = (x^2)° and m$\angle$2 = (2x - 15)°. Find the value of x that makes lines k and n parallel.

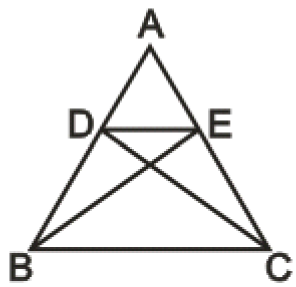


x = 13

6.

Given: $\overline{BD} \cong \overline{CE}$, $\overline{AD} \cong \overline{AE}$

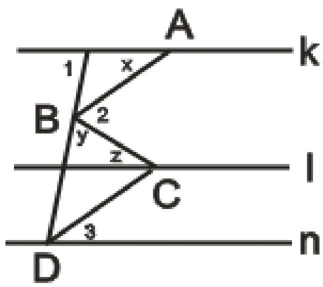
Prove: $\angle BCD \cong \angle CBE$



Statements	Reasons
1. $\overline{BD} \cong \overline{CE}$, $\overline{AD} \cong \overline{AE}$	1. Given
2. $\overline{BD} + \overline{AD} \cong \overline{CE} + \overline{AE}$	2. Addition
3. $\overline{BA} \cong \overline{CA}$	3. Substitution
4. $\angle A \cong \angle A$	4. Reflexive
5. $\triangle ADC \cong \triangle AEB$	5. SAS
6. $\overline{BE} \cong \overline{CD}$	6. CPCTC
7. $\overline{BC} \cong \overline{BC}$	7. Reflexive
8. $\triangle DBC \cong \triangle ECB$	8. SSS
9. $\angle BCD \cong \angle CBE$	9. CPCTC

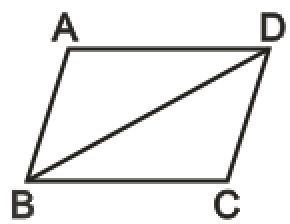
Answer Key 0903204
Key # 2

7. k || l || n and $\overline{AB} \parallel \overline{CD}$. If m∠1 = 75°, m∠2 = 63°, and m∠3 = 38°, then m∠x + m∠y + m∠z = ______.



155°

8. Given: m∠ABD = (2x + 9y + 78)°, m∠CBD = (4x + y + 52)°, m∠ADB = (x + 8y + 58)° and m∠CDB = (2x + 4y + 63)°. What values must x and y have to make the quadrilateral a parallelogram?



x = -5 and y = -3

9. In right △ABC, altitude $\overline{CD}$ is drawn to the hypotenuse. If AD = 8, BD = 18, and CD = x + 9, find the length of the altitude.

12

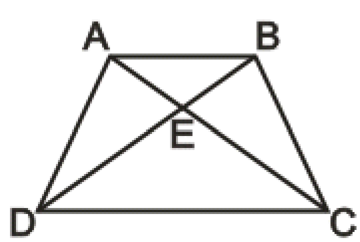
10. E is the midpoint of $\overline{DF}$. If DE = 3x + 33 and EF = 7x + 13, then DF = ______.

96

11.

Given: $\overline{BD}$ bisects ∠ADC. $\overline{AC}$ bisects ∠BCD. ∠ADC ≅ ∠BCD

Prove: $\overline{AD} \cong \overline{BC}$



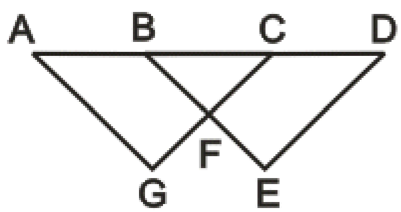
Statements	**Reasons**
1. $\overline{BD}$ bisects ∠ADC. $\overline{AC}$ bisects ∠BCD.	1. Given

2. $\angle BDC = (1/2)\angle ADC$, $\angle ACD = (1/2)\angle BCD$	**2.** Definition of bisect
3. $\angle ADC \cong \angle BCD$	**3.** Given
4. $(1/2)\angle ADC \cong (1/2)\angle BCD$	**4.** Multiplication
5. $\angle BDC \cong \angle ACD$	**5.** Substitution
6. $\overline{DC} \cong \overline{DC}$	**6.** Reflexive
7. $\triangle ACD \cong \triangle BDC$	**7.** ASA
8. $\overline{AD} \cong \overline{BC}$	**8.** CPCTC

12.

Given: $\overline{AG} \parallel \overline{BE}$, $\overline{CG} \parallel \overline{DE}$, $\overline{AB} \cong \overline{CD}$

Prove: $\angle G \cong \angle E$



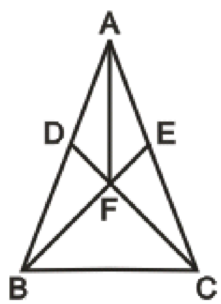
Statements	**Reasons**
1. $\overline{AG} \parallel \overline{BE}$, $\overline{CG} \parallel \overline{DE}$, $\overline{AB} \cong \overline{CD}$	**1.** Given
2. $\overline{BC} \cong \overline{BC}$	**2.** Reflexive postulate
3. $\overline{AB} + \overline{BC} \cong \overline{CD} + \overline{BC}$	**3.** Addition
4. $\overline{AC} \cong \overline{BD}$	**4.** Substitution
5. $\angle A \cong \angle DBE$, $\angle D \cong \angle ACG$	**5.** If two parallel lines are cut by a transversal the corresponding angles are congruent.
6. $\triangle ACG \cong \triangle BDE$	**6.** ASA
7. $\angle G \cong \angle E$	**7.** CPCTC

Answer Key 0903204
Key # 2

13. In rectangle ABCD, AB=(2x + 5y - 117), BC=(4x + 2y - 102), CD=(3x - 7y + 78), and DA=(7x + 2y - 165). Find the perimeter of the rectangle.
66

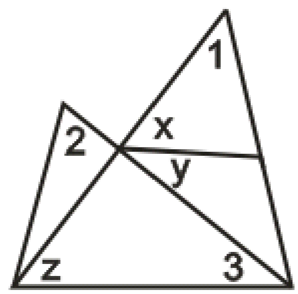
14. In △ABC, $\overline{AB} \cong \overline{AC}$, m∠A=(x + 74)° and m∠B=(x + 47)°. Find all three angles.
m∠A=78°, m∠B=51°, m∠C=51°

15. If $\overline{AB} \cong \overline{AC}$ and $\overline{AD} \cong \overline{AE}$, how many pairs of congruent triangles are there in the figure?



- (A) 6
- (●) 5
- (C) 4
- (D) 3

16. If m∠1 = 51°, m∠2 = 69°, and m∠3 = 42°, then m∠x + m∠y - m∠z = ______.



42°

17. In right △ABC, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$. Which line segment is NOT a hypotenuse?
- (●) $\overline{CD}$
- (B) $\overline{BC}$
- (C) $\overline{AB}$
- (D) $\overline{AC}$

18. In right triangle ABC, the length of leg BC is $6\sqrt{3}$. If the area of the triangle is $54\sqrt{3}$, find the measure of ∠A.
- (●) 30°
- (B) 45°
- (C) 60°
- (D) 90°

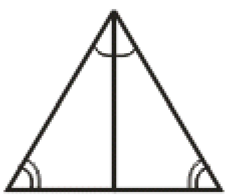
Answer Key 0903204
Key # 2

19. ABCD is a rectangle with diagonals intersecting at E. Given that AB = 12 and BC = 5, find the length of $\overline{DE}$.
<u>13/2</u>

20. In ▱ABCD, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at E. If m∠ACB=(2x + 1)°, m∠ADB=(4x + 6)°, m∠AED=107°, find the value of x.
<u>**x = 11**</u>

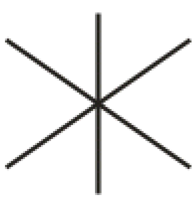
21. What happens if the triangles share a side, part of a side, or part of an angle?
<u>**If they share a whole side, you use the Reflexive Postulate to get it congruent to itself, and count it as a side. If they share part of a side or part of an angle, you first use Reflexive. You then need another equation so that you can either add or subtract, and then use Substitution to get the whole angle or side.**</u>

22. State whether or not each of the following triangle pairs is congruent. If so, state a reason.



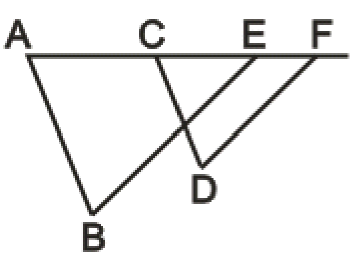
<u>**Yes, AAS**</u>

23. State whether the figure is a polygon. If it is, identify the polygon and state whether it is convex or concave. If it is not, explain why.



<u>**No, because some of the segments intersect more than two other segments.**</u>

24.
Given: $\overline{AB} \parallel \overline{CD}$, $\overline{BE} \parallel \overline{DF}$
Prove: $\overline{BE} \times \overline{CF} \cong \overline{DF} \times \overline{AE}$

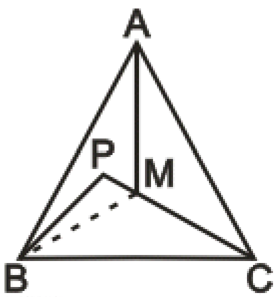


Statements	**Reasons**
1. $\overline{AB} \parallel \overline{CD}$, $\overline{BE} \parallel \overline{DF}$	1. Given
2. ∠A ≅ ∠DCF, ∠BEA ≅ ∠F	2. Parallel lines cut by a

	transversal form congruent corresponding angles.
3. $\triangle ABE \sim \triangle CDF$	**3.** AA
4. $\frac{\overline{BE}}{\overline{DF}} \cong \frac{\overline{AE}}{\overline{CF}}$	**4.** Similar triangles have corresponding sides in proportion.
5. $\overline{BE} \times \overline{CF} \cong \overline{DF} \times \overline{AE}$	**5.** The product of the means equals the product of the extremes.

Answer Key 0496849
Key # 3

1. Michael had a geometry quiz today. He answered all questions correctly except for one: In △ABC, $\overline{AB} \cong \overline{AC}$, P is a point inside the triangle, and $\overline{AM}$ bisects ∠A and meets $\overline{PC}$ at M. Prove $\overline{PC} > \overline{PB}$.
Michael showed you his steps for his proof. Please tell Michael which step was wrong?



(A) ∵ ∠BAM ≅ ∠CAM, $\overline{AM} \cong \overline{AM}$
(B) ∴ △AMB ≅ △AMC by SAS
(C) ∴ $\overline{MB} \cong \overline{MC}$
● In △BPM, ∵ $\overline{PM} \perp \overline{PB}$
(E) ∴ $\overline{PM} + \overline{MC} > \overline{BP}$, $\overline{PC} > \overline{PB}$

2. Which of the following equations is NOT equivalent to $\frac{a}{b}=\frac{c}{d}$ = ab ?
(A) $\frac{x+y}{z-y} = \frac{z}{x-y}$
(B) $\frac{b}{a}=\frac{d}{c}$ = $\frac{x+y}{z}$
(C) $\frac{2y}{x+z}$ = $\frac{p}{q}=\frac{x}{y}$ $\frac{p}{q}=\frac{r}{s}$
● cd = $\frac{a+b}{b}=\frac{c+d}{d}$
(E) $\frac{d}{b}=\frac{c}{a}$ = $\frac{a^2}{b^2}=\left(\frac{c}{d}\right)^2$

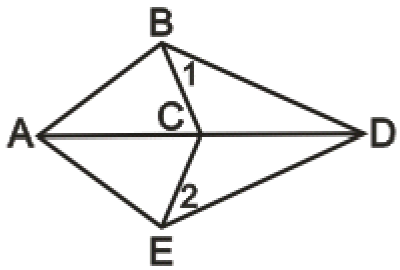
3. In △XYZ, $\overline{YX}$ is extended through X to W and $\overline{XZ} \cong \overline{XY}$. m∠WXZ=(4x - 18)° and m∠Y=(x + 5)°. Find x.
x = 14

4. ⊙P and ⊙Q are congruent circles that intersect at C and D. What kind of quadrilateral must PCQD be?
(A) a square
● a rhombus
(C) a trapezoid
(D) a parallelogram

Answer Key 0496849
Key # 3

5.

Given: $\overline{AB} \cong \overline{AE}$, $\overline{BC} \cong \overline{EC}$
Prove: $\angle 1 \cong \angle 2$

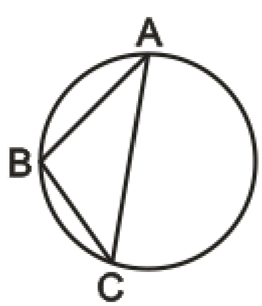


Statements	**Reasons**
1. $\overline{AB} \cong \overline{AE}$, $\overline{BC} \cong \overline{EC}$	1. Given
2. $\overline{AC} \cong \overline{AC}$	2. Reflexive
3. $\triangle ABC \cong \triangle AEC$	3. SSS
4. $\angle BCA \cong \angle ECA$	4. CPCTC
5. $\angle BCA$ and $\angle BCD$ are supplements. $\angle ECA$ and $\angle ECD$ are supplements.	5. Definition of supplements
6. $\angle BCD \cong \angle ECD$	6. Supplements of congruent angles are congruent.
7. $\overline{CD} \cong \overline{CD}$	7. Reflexive
8. $\triangle BCD \cong \triangle ECD$	8. SAS
9. $\angle 1 \cong \angle 2$	9. CPCTC

6.

Given: $\angle B > \angle C$

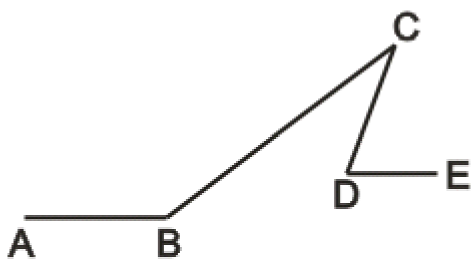
Prove: $\overset{\frown}{ACB} > \overset{\frown}{ABC}$



Statements	**Reasons**
1. $\angle B > \angle C$	1. Given
2.	2. If two inscribed angles are

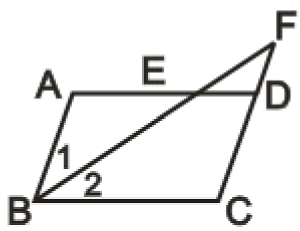
$\overset{\frown}{AC} > \overset{\frown}{AB}$	unequal, the arcs they intercept are unequal in the same order.
3. $\overset{\frown}{BC} \cong \overset{\frown}{BC}$	**3.** Reflexive
4. $\overset{\frown}{AC} + \overset{\frown}{BC} > \overset{\frown}{AB} + \overset{\frown}{BC}$	**4.** Addition property of inequalities
5. $\overset{\frown}{ACB} > \overset{\frown}{ABC}$	**5.** Substitution

7. If $\overline{AB} \parallel \overline{DE}$, m∠ABC = 2(m∠CDE), and m∠BCD = 30°, then m∠CDE = ______.



70°

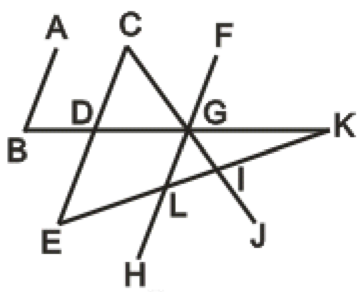
8. In ▱ABCD, m∠1 = m∠2, CF = 15 cm, AB = 11 cm, and m∠C = 95°. Find the perimeter of ▱ABCD.



52 cm

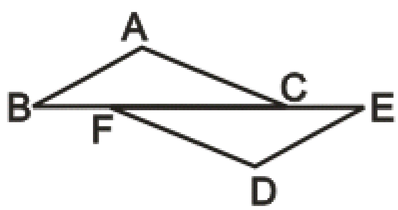
Answer Key 0496849
Key # 3

9. $\overline{AB} \parallel \overline{CE} \parallel \overline{FH}$, m∠B = 70°, m∠K = 21°, and $\overline{CJ}$ bisects ∠BGF. Find m∠E and m∠FGK.



m∠E = 49°, m∠FGK = 70°

10. Given: ∠A ≅ ∠D, ∠B ≅ ∠E, and $\overline{BF}$ ≅ $\overline{CE}$. If △ABC can be proven congruent to △DEF, state the congruency postulate involved.



AAS

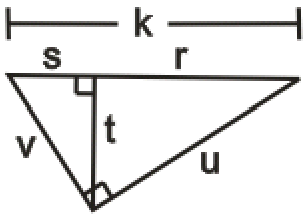
11. Why doesn't CPCTC guarantee that triangles are equilateral and/or equiangular?
Because the pieces of the first are congruent to the pieces of the second; the pieces of the first do NOT have to be congruent to each other.

12. ABCD is a rectangle with diagonals intersecting at E. Given that AB = 8 and BC = 6, find the length of $\overline{DE}$.
5

13. State whether the polygon is best described as equiangular, equilateral, regular, or none of these.

Octagon; regular

14. Which of the following statements is NOT true?



● If sr = 8t and k = 24, then $s^2 + t^2 = 568$.

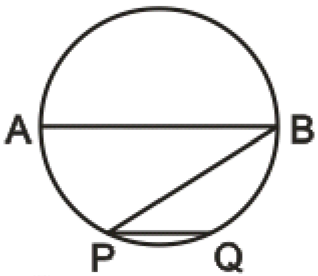
Ⓑ If s = 4 and r = 10, then t= $2\sqrt{10}$.

Ⓒ If s = 4 and k = 15, then u = $\sqrt{165}$.

Ⓓ If s = 4 and t = 6, then k = 13.

Answer Key 0496849
Key # 3

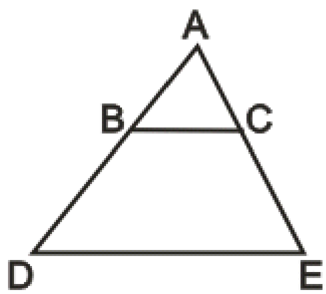
15. Diameter $\overline{AB}$ is parallel to chord $\overline{PQ}$. If the measure of arc BQ is twice of that of arc PQ, find the measure of angle ABP.



36°

16.
Given: $\overline{BC} \parallel \overline{DE}$

Prove: $\overline{AB} \times \overline{DE} \cong \overline{AD} \times \overline{BC}$



Statements	**Reasons**
1. $\overline{BC} \parallel \overline{DE}$	1. Given
2. $\angle ABC \cong \angle D$, $\angle ACB \cong \angle E$	2. Parallel lines cut by a transversal form congruent corresponding angles.
3. $\triangle ABC \sim \triangle ADE$	3. AA
4. $\frac{\overline{AB}}{\overline{AD}} \cong \frac{\overline{BC}}{\overline{DE}}$	4. Similar triangles have corresponding sides in proportion.
5. $\overline{AB} \times \overline{DE} \cong \overline{AD} \times \overline{BC}$	5. The product of the means equals the product of the extremes.

17. Plane X is parallel to plane Y. If plane Z intersects X in line k and Y in line n, then k is ______ parallel to n.
- (A) always
- (B) never
- (C) sometimes

18. In circle O, secant $\overline{ABC}$ and chord $\overline{BD}$ intersect. If m$\overset{\frown}{AD}$ = 188° and m$\overset{\frown}{BD}$ = 59°,

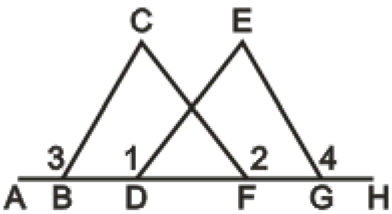
find m∠CBD.

86°

19.

Given: ∠1 ≅ ∠2, ∠3 ≅ ∠4, $\overline{BD} \cong \overline{FG}$

Prove: ∠C ≅ ∠E

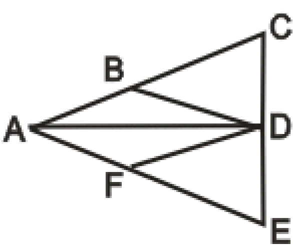


Statements	Reasons
1. ∠1 ≅ ∠2	1. Given
2. ∠1 and ∠EDF are supplements. ∠2 and ∠CFD are supplements.	2. Definition of supplements
3. ∠3 ≅ ∠4	3. Given
4. ∠3 and ∠CBF are supplements. ∠4 and ∠EGD are supplements.	4. Definition of supplements
5. ∠EDF ≅ ∠CFD, ∠CBF ≅ ∠EGD	5. Supplements of congruent angles are congruent.
6. $\overline{BD} \cong \overline{FG}$	6. Given
7. $\overline{DF} \cong \overline{DF}$	7. Reflexive
8. $\overline{BD} + \overline{DF} \cong \overline{FG} + \overline{DF}$	8. Addition
9. $\overline{BF} \cong \overline{DG}$	9. Substitution
10. △CBF ≅ △EGD	10. ASA
11. ∠C ≅ ∠E	11. CPCTC

20.

Given: $\overline{AB} \cong \overline{AF}$, $\overline{AC} \cong \overline{AE}$, D is the midpoint of $\overline{CE}$.

Prove: ∠BDA ≅ ∠FDA



Statements	Reasons
1. $\overline{AC} \cong \overline{AE}$, $\overline{AB} \cong \overline{AF}$	1. Given
2. ∠ACD ≅ ∠AEC	2. If two sides of a triangle are congruent, the angles

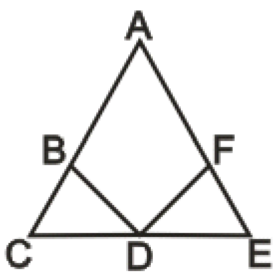
Statements	Reasons
	opposite those sides are congruent.
3. $\overline{AC} - \overline{AB} \cong \overline{AE} - \overline{AF}$	**3.** Subtraction
4. $\overline{BC} \cong \overline{FE}$	**4.** Substitution
5. D is the midpoint of $\overline{CE}$.	**5.** Given
6. $\overline{CD} \cong \overline{ED}$	**6.** Definition of midpoint
7. $\triangle BCD \cong \triangle FED$	**7.** SAS
8. $\overline{BD} \cong \overline{FD}$	**8.** CPCTC
9. $\overline{AD} \cong \overline{AD}$	**9.** Reflexive
10. $\triangle ABD \cong \triangle AFD$	**10.** SSS
11. $\angle BDA \cong \angle FDA$	**11.** CPCTC

Answer Key 0756486
Key # 4

1.

Given: D is the midpoint of $\overline{CE}$. $\overline{AC} \cong \overline{AE}$, $\overline{AB} \cong \overline{AF}$, $\angle C \cong \angle E$

Prove: $\overline{BD} \cong \overline{FD}$

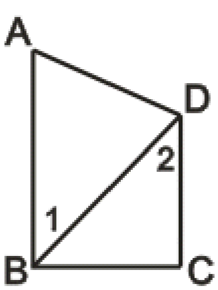


Statements	**Reasons**
1. $\overline{AC} \cong \overline{AE}$, $\overline{AB} \cong \overline{AF}$	1. Given
2. $\overline{AC} - \overline{AB} \cong \overline{AE} - \overline{AF}$	2. Subtraction
3. $\overline{BC} \cong \overline{FE}$	3. Substitution
4. D is the midpoint of $\overline{CE}$.	4. Given
5. $\overline{CD} \cong \overline{DE}$	5. Definition of midpoint
6. $\angle C \cong \angle E$	6. Given
7. $\triangle BCD \cong \triangle FED$	7. SAS
8. $\overline{BD} \cong \overline{FD}$	8. CPCTC

2.

Given: $\overline{AB} \perp \overline{BC}$, $\angle 1 \cong \angle 2$

Prove: $\overline{DC} \perp \overline{BC}$



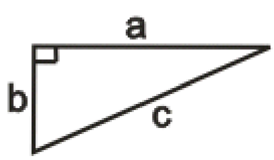
Statements	**Reasons**
1. $\overline{AB} \perp \overline{BC}$, $\angle 1 \cong \angle 2$	1. Given
2. $\overline{AB} \parallel \overline{DC}$	2. If two lines are cut by a transversal forming congruent

Statements	Reasons
	alternate interior angles, the lines are parallel.
3. $\overline{DC} \perp \overline{BC}$	3. If a line is perpendicular to one of two parallel lines, it is perpendicular to the other.

3. What is the relationship between a central angle and an angle inscribed in the same arc?
The central angle will always be equal to the arc, and double the measure of the inscribed angle.

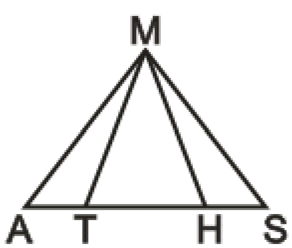
4. The governor wants to build a new library for three cities X, Y, and Z. If the distance between each two cities is 12 kilometers, and the location of the new library will be in equidistance to all three cities, what is the distance between the new library and city X?
$4\sqrt{3}$

5. If a = 13 and b = 10, find c.



$\sqrt{269}$

6.
Given: $\overline{AT} \cong \overline{HS}$, $\overline{MT} \cong \overline{MH}$
Prove: $\triangle$AMS is isosceles.

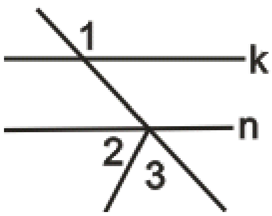


Statements	Reasons
1. $\overline{MT} \cong \overline{MH}$	1. Given
2. $\angle$MTH $\cong$ $\angle$MHT	2. If two sides of a triangle are congruent, the opposite angles are congruent.
3. $\angle$MTH and $\angle$MTA are supplements. $\angle$MHT and $\angle$MHS are supplements.	3. Definition of supplements
4. $\angle$MTA $\cong$ $\angle$MHS	4. Supplements of congruent angles are congruent.
5. $\overline{AT} \cong \overline{HS}$	5. Given
6. $\triangle$MAT $\cong$ $\triangle$MSH	6. SAS
7. $\overline{AM} \cong \overline{SM}$	7. CPCTC
8.	8. Definition of isosceles

△AMS is isosceles.

Answer Key 0756486
Key # 4

7. m∠1 = 135°, m∠2 = 63°, m∠3 = 77°. Is k ∥n? If so, explain how.



<u>**No**</u>

8. Suppose the ratio of the side lengths of a regular hexagon ABCDEF to the corresponding side lengths of another regular hexagon A'B'C'D'E'F' are $\sqrt{3}$:1. If the area of hexagon ABCDEF is x and the area of hexagon A'B'C'D'E'F' is x', then x:x' = ______.

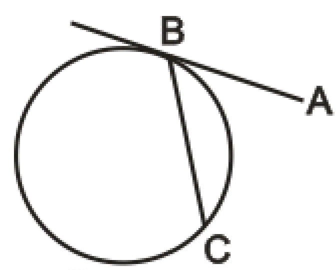
- (A) $\sqrt{3}:1$
- (B) 3:1 (filled in)
- (C) $\sqrt{2}:1$
- (D) 2:1

9. ABCD is a rhombus. If AB=(8x - 104), CD=(10x - 130), find the value of x.
<u>**x = 13**</u>

10. Why does an equilateral triangle have to be equiangular?
<u>**Draw equilateral triangle ABC. Now consider sides $\overline{AB}$ and $\overline{BC}$. They're congruent, so ∠A and ∠C are congruent. Now consider sides $\overline{AB}$ and $\overline{CA}$. They're also congruent, so ∠B and ∠C are congruent. Therefore, all three angles are congruent. We can conclude that an equilateral triangle have to be equiangular.**</u>

11. Does CPCTC prove triangles congruent? Why or why not?
<u>**No. CPCTC is a result of congruent triangles, not a cause of them. It can only be used after ASA, SAS, SSS, AAS or HL.**</u>

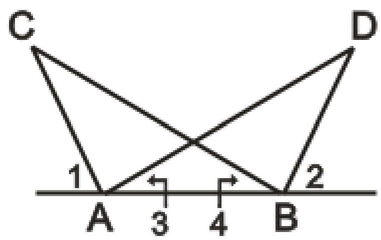
12. Tangent $\overline{AB}$ and chord $\overline{BC}$ are drawn to circle O. The measure of major $\overset{\frown}{BC}$ is $(6x + 167)°$ and the measure of minor $\overset{\frown}{BC}$ is $(4x - 87)°$. Find m∠ABC.



<u>**12.5**</u>°

Answer Key 0756486
Key # 4

13. Given: $\angle 1 \cong \angle 2$ and $\angle 3 \cong m\angle 4$. Prove $\overline{AD} \cong \overline{BC}$.

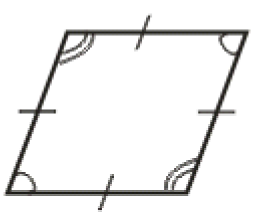


(1) $\because \angle 1 \cong \angle 2 \therefore \angle BAC \cong \angle ABD$

(2) $\because \angle 3 \cong \angle 4$, $\overline{AB} \cong \overline{AB}$, and $\angle BAC \cong \angle ABD \therefore \triangle ABC \cong \triangle BAD$ by ASA

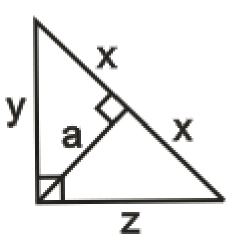
(3) $\therefore \overline{AD} \cong \overline{BC}$

14. State whether the polygon is best described as equiangular, equilateral, regular, or none of these.



Quadrilateral; equilateral

15. If a = 100, find the value of x, y, and z.

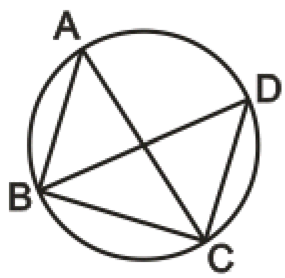


$x = 10$, $y = 10\sqrt{2}$, $z = 10\sqrt{2}$

16.

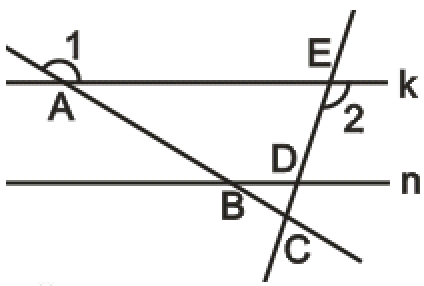
Given: $\overset{\frown}{AB} \cong \overset{\frown}{CD}$

Prove: $\angle ABC \cong \angle DCB$



Statements	**Reasons**
1. $\overset{\frown}{AB} \cong \overset{\frown}{CD}$	1. Given
2. $\overset{\frown}{AD} \cong \overset{\frown}{AD}$	2. Reflexive postulate
3. $\overset{\frown}{AB} + \overset{\frown}{AD} \cong \overset{\frown}{CD} + \overset{\frown}{AD}$	3. Addition
4. $\overset{\frown}{BAD} \cong \overset{\frown}{CDA}$	4. Substitution
5. $\angle ABC \cong \angle DCB$	5. In a circle, angles inscribed in congruent arcs are congruent.

17. If $k \parallel n$, $m\angle 1 = 130°$, and $m\angle 2 = 102°$, find the measure of $\angle ACE$.

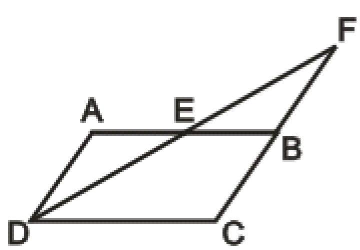


52°

18.

Given: B is the midpoint of $\overline{FC}$. $\overline{AB}$ and $\overline{FD}$ bisect each other. $\overline{AD} \cong \overline{BC}$

Prove: $\angle ADF \cong \angle F$



Statements	**Reasons**
1. B is the midpoint of $\overline{FC}$.	1. Given
2. $\overline{BF} \cong \overline{BC}$	2. Definition of midpoint
3. $\overline{AD} \cong \overline{BC}$	3. Given
4. $\overline{AD} \cong \overline{BF}$	4. Substitution
5.	5. Given

$\overline{AB}$ and $\overline{FD}$ bisect each other.

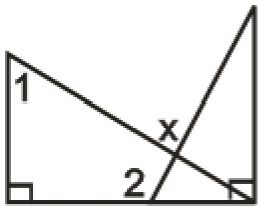
6. $\overline{AE} \cong \overline{EB}$, $\overline{DE} \cong \overline{EF}$ — **6.** Definition of bisect

7. $\triangle$AED $\cong$ $\triangle$BEF — **7.** SSS

8. $\angle$ADF $\cong$ $\angle$F — **8.** CPCTC

Answer Key 0756486
Key # 4

19. If m∠1 = 53°, and m∠2 = 114°, then m∠x = ______.



77°

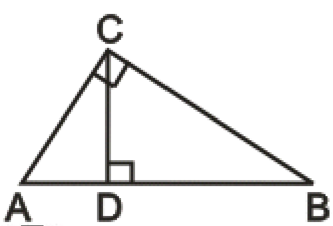
20. State whether the figure is a polygon. If it is, identify the polygon and state whether it is convex or concave. If it is not, explain why.

No, because it has a side that is not a segment.

21. ⊙P and ⊙Q are congruent circles that intersect at C and D. If the radius is 13 cm and PQ = 12 cm, what is the area of quadrilateral PCQD?
$12\sqrt{133}$ cm^2

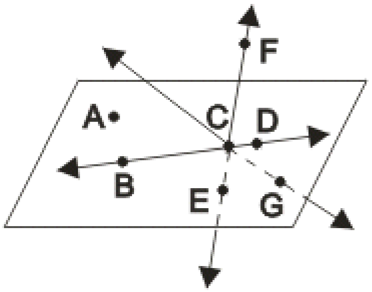
22. E is the midpoint of $\overline{DF}$. If DE = 3x + 6 and EF = 51, find the value of x.
x = 15

23. In △ABC, AD = 8 and DB = 24. Find AC.



- (A) $8\sqrt{3}$
- (B) $4\sqrt{2}$
- (C) $16\sqrt{3}$
- ● 16
- (E) 4

24. Points E, F, and G are ______.



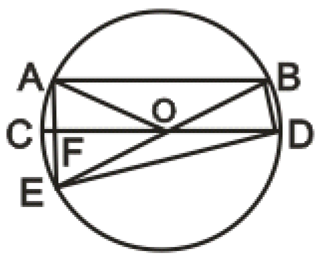
(A) collinear
(B) noncoplanar
(C) noncollinear
(D) coplanar

Answer Key 0939992
Key # 5

1. The perimeter of a triangle is 135 cm and the lengths of its sides are in the ratio 10 :7:10. Find the length of each side.
50 cm, 35 cm, 50 cm

2. Does AAA guarantee that two triangles are congruent? Why or why not?
No, because the sides could vary.

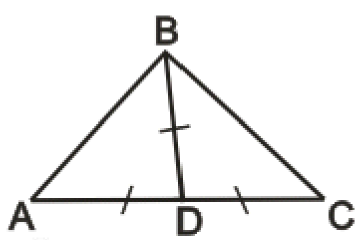
3. In circle O, chord $\overline{AB}$ is parallel to diameter $\overline{CD}$. If m$\overset{\frown}{AB}$ = 4m$\overset{\frown}{AC}$, find (a) m$\overset{\frown}{AC}$ (b) m∠AOB (c) m∠AEB (d) m∠AFC (e) m∠BDE.



ANSWERS:

a) 30° b) 120° c) 60° d) 90° e) 90°

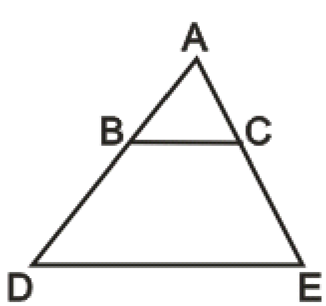
4. If m∠A = 38°, find m∠ABC.



90°

5. Given: $\overline{BC} \parallel \overline{DE}$

Prove: $\overline{AB} \times \overline{DE} \cong \overline{AD} \times \overline{BC}$



Statements	**Reasons**
1. $\overline{BC} \parallel \overline{DE}$	1. Given
2. ∠ABC ≅ ∠D, ∠ACB ≅ ∠E	2. Parallel lines cut by a

	transversal form congruent corresponding angles.
3. $\triangle ABC \sim \triangle ADE$	**3.** AA
4. $\frac{\overline{AB}}{\overline{AD}} \cong \frac{\overline{BC}}{\overline{DE}}$	**4.** Similar triangles have corresponding sides in proportion.
5. $\overline{AB} \times \overline{DE} \cong \overline{AD} \times \overline{BC}$	**5.** The product of the means equals the product of the extremes.

6. When two secants are drawn from an external point to the same circle, the measurement of one particular arc will enable you to find the measure of the angle formed by the secants.

(A) False

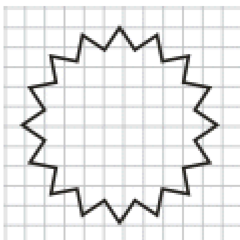
(B) True

Answer Key 0939992
Key # 5

7. Suppose M is between L and N. LM = 5x - 19, MN = 2x - 9, LN = 11x - 60. Find the value of the variable and the lengths of $\overline{LM}$, $\overline{MN}$, and $\overline{LN}$.
a) x = 8
b) LM = 21, MN = 7, LN = 28

8. The coordinates of a parallelogram are (1, -1), (3, 2), (9, 0), and (x, y) and x > 9. What is the value of x + y?
14

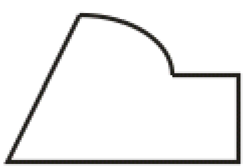
9. State whether the polygon is best described as equiangular, equilateral, regular, or none of these.



32-gon; equilateral

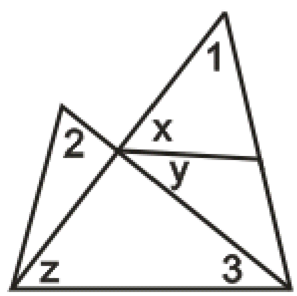
10. Suppose there are n non-collinear points in the interior of ∠XYZ. How many pairs of adjacent angles are in ∠XYZ?
(A) n - 1
(B) n + 1
(C) 2n
(D) n(n + 1)
(●) n

11. State whether the figure is a polygon. If it is, identify the polygon and state whether it is convex or concave. If it is not, explain why.



No, because it has a side that is not a segment.

12. If m∠1 = 51°, m∠2 = 68°, and m∠3 = 39°, then m∠x + m∠y - m∠z = ______.



39°

13. Draw a circle O with radius 12. Then draw radii $\overline{OA}$ and $\overline{OB}$ to form an angle of 60 degrees. What is the length of $\overline{AB}$?
12

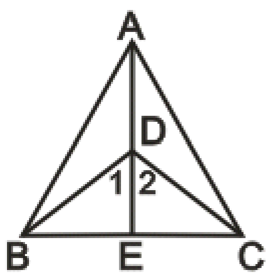
14. Secants $\overline{ABC}$ and $\overline{EDC}$ are drawn to circle O. If m$\widehat{AE}$ = 151° and m$\widehat{BD}$ = 42°, find m∠C.
54.5°

Answer Key 0939992
Key # 5

15. ABCD is a rectangle with diagonals intersecting at E. Given that AB = 12 and BC = 6, find the length of $\overline{DE}$.
$3\sqrt{5}$

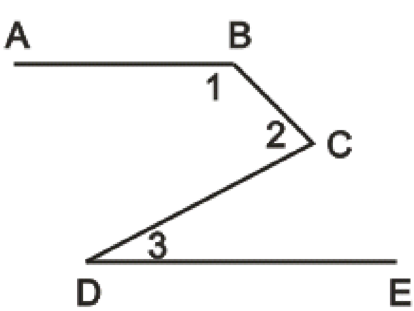
16. A rectangle has a diagonal of 10 and length of $2\sqrt{6}$. Find the area of the rectangle.
$4\sqrt{114}$ square units

17.
Given: $\overline{AE}$ bisects $\angle$BAC. $\overline{AB} \cong \overline{AC}$
Prove: $\angle 1 \cong \angle 2$



Statements	**Reasons**
1. $\overline{AE}$ bisects $\angle$BAC.	1. Given
2. $\angle BAD \cong \angle CAD$	2. Definition of bisect
3. $\overline{AB} \cong \overline{AC}$	3. Given
4. $\overline{AD} \cong \overline{AD}$	4. Reflexive
5. $\triangle ABD \cong \triangle ACD$	5. SAS
6. $\angle ADB \cong \angle ADC$	6. CPCTC
7. $\angle$ADB and $\angle$1 are supplements. $\angle$ADC and $\angle$2 are supplements	7. Definition of supplements
8. $\angle 1 \cong \angle 2$	8. Supplements of congruent angles are congruent.

18. If $\overline{AB} \parallel \overline{DE}$, m$\angle$1 = 140°, and m$\angle$2 = 79°, then m$\angle$3 = ______.

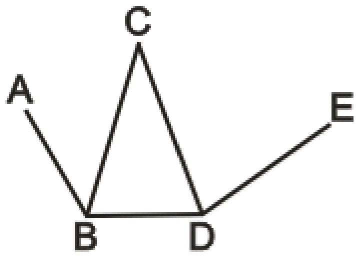


39°

19. Name the properties of a rhombus.
1) All sides are congruent. 2) Opposite sides are parallel. 3) Diagonals bisect each other. 4) Opposite angles are congruent. 5) Diagonals are perpendicular. 6) Diagonals bisect the angles.

20.

Given: ∠EDB > ∠ABD, $\overline{CB} \cong \overline{CD}$
Prove: ∠CDB > ∠ABC



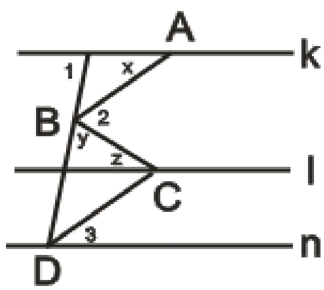
Statements	**Reasons**
1. $\overline{CB} \cong \overline{CD}$	1. Given
2. ∠CBD ≅ ∠CDB	2. If two sides of a triangle are congruent, the angles opposite them are congruent.
3. ∠EDB > ∠ABD	3. Given
4. ∠EDB-∠CDB > ∠ABD-∠CBD	4. Subtraction property of inequalities
5. ∠CDB > ∠ABC	5. Substitution

Answer Key 0939992
Key # 5

21. How many degrees are in each acute angle of an isosceles right triangle?
45°. The right angle takes up 90°, so there are 90° left. Since the triangle is isosceles, those angles are congruent

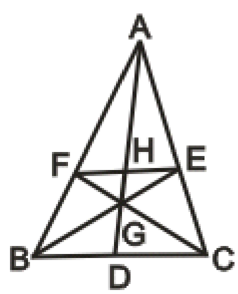
22. Seven 45°-45°-90° triangles share one vertex. The hypotenuse of one triangle is the leg of the neighboring triangle. If the length of the hypotenuse of the first (also the smallest) triangle is r, express the length of the hypotenuse of the seventh triangle in terms of r.
$8\sqrt{2}r$

23. $k \parallel l \parallel n$ and $\overline{AB} \parallel \overline{CD}$. If $m\angle 1 = 79°$, $m\angle 2 = 64°$, and $m\angle 3 = 33°$, then $m\angle x + m\angle y + m\angle z$ = ______.



149°

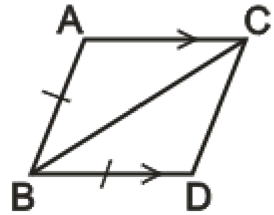
24. Medians $\overline{AD}$, $\overline{BE}$, and $\overline{CF}$ of $\triangle$ABC meet at G, $\overline{EF}$ intersects $\overline{AD}$ at H, and $\overline{AD}$ = 21. Find $\overline{GH}$.



3.5

25. In $\triangle$ABC, the measure of angle B is twice the measure of angle A. Angle C measures three times the measure of angle A. If AC = 38, find AB.
- (A) $38\sqrt{3}$
- (B) $19\sqrt{2}$
- (C) 38
- (D) 19
- (●) $19\sqrt{3}$

26. Is $\triangle$ABC $\cong$ $\triangle$DBC? If so, name the postulate or theorem used.



No congruence can be deduced.