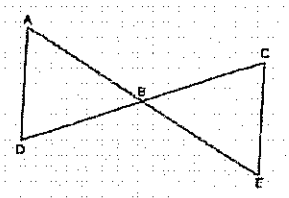
EOC Review Day 1
Reasoning, Proofs, and Definitions

Objective: Use deductive reasoning to prove that a valid geometric statement is true.

1. A two-column proof is shown. Fill in the blanks for steps 5 and 6 to complete the proof.



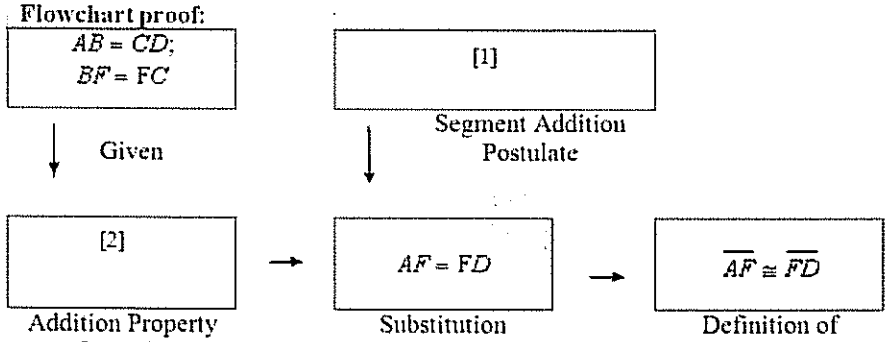
Given: B is the midpoint of $\overline{AE}$
B is the midpoint of $\overline{CD}$
Prove: $\Delta ABD \cong \Delta EBC$

Statement	Reason
1. B is the midpoint of $\overline{AE}$	1. Given
2. $\overline{AB} \cong \overline{BE}$	2. Definition of midpoint
3. B is the midpoint of $\overline{CD}$	3. Given
4. $\overline{CB} \cong \overline{BD}$	4. Definition of midpoint
5. _____	5. Vertical Angles Theorem
6. $\Delta ABD \cong \Delta EBC$	6. _____

2. A flowchart proof is shown. Fill in the blanks for [1] and [2] to complete the proof.

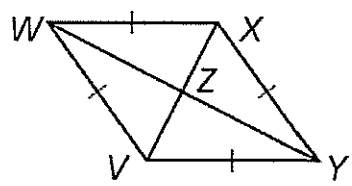
Given: AB = CD and BF = FC
Prove: $\overline{AF} \cong \overline{FD}$

Flowchart proof:



a.	[1] $AB + BF = AF; FC + CD = FD$ [2] $AF = FD$	c.	[1] $AB = CD; BF = FC$ [2] $AB + BF = FC + CD$
b.	[1] $AF = FD$ [2] $AB + BF = FC + CD$	d.	[1] $AB + BF = AF; FC + CD = FD$ [2] $AB + BF = FC + CD$

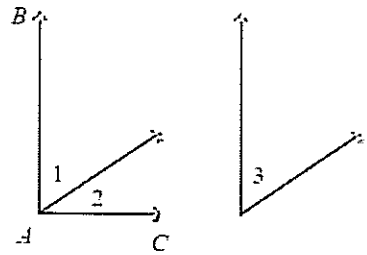
3. A two-column proof is shown. Fill in the blanks for steps 3, 6 and 11 to complete the proof.



Given: $VWXY$ is a rhombus.
Prove: $\overline{VX} \perp \overline{WY}$

Statement	Reason
1. VWXY is a rhombus	1. Given
2. $\overline{WX} \cong \overline{XY} \cong \overline{YV} \cong \overline{VW}$	2. Definition of a rhombus
3. _____	3. If a figure is a rhombus, then it is a parallelogram
4. $\overline{WZ} \cong \overline{ZY}$	4. If a figure is a parallelogram, then its diagonals bisect each other
5. $\overline{ZX} \cong \overline{ZX}$	5. Reflexive Property of Congruence
6. $\Delta WZX \cong \Delta YZX$	6. _____
7. $\angle WZX \cong \angle YZX$	7. Corresponding Parts of Congruent Triangles are Congruent (CPCTC)
8. $\angle WZX \cong \angle YZX$ are supplementary	8. Linear Pair Postulate
9. $\angle WZX \cong \angle YZX$ are right angles	9. If supplementary angles are congruent, then they are right angles.
10. $m\angle WZX = m\angle YZX$	10. Definition of right angles
11. _____	11. Definition of $\perp$

4. A paragraph proof is shown. Fill in the blanks for [1] and [2] to complete the proof.



Given: $\angle BAC$ is a right angle. $\angle 1 \cong \angle 3$
Prove: $\angle 2$ and $\angle 3$ are complementary.

Paragraph proof:

Since $\angle BAC$ is a right angle, $m\angle BAC = 90°$ by the definition of a right angle. By ___1___ $m\angle BAC = m\angle 1 + m\angle 2$. By substitution, $m\angle 1 + m\angle 2 = 90°$. Since $\angle 1 \cong \angle 3$, $m\angle 1 = m\angle 3$ by the ___2___. Using substitution, $m\angle 3 + m\angle 2 = 90°$. Thus, by the definition of complementary angles, $\angle 2$ and $\angle 3$ are complementary.

a.	[1] Substitution [2] Definition of congruent angles	c.	[1] Angle Addition Postulate [2] Definition of equality
b.	[1] Angle Addition Postulate [2] Definition of congruent angles	d.	[1] Substitution [2] Definition of equality

Objective: Write the converse, inverse and contrapositive of a valid proposition and determine their validity.

5. Given the Conditional statement: If $\angle B = 45°$, then $\angle B$ is acute, state whether the conditional statement is true and give the converse, inverse and contrapositive of the statement and determine the truth value.

Statement	Example	Truth Value
Conditional	If $m\angle B = 45°$, then $\angle B$ is acute	
Converse		
Inverse		
Contrapositive		

6. Conditional Statement: If two angles are vertical angles, then they are congruent.

Determine the truth value of the conditional statement and its converse.
Provide a counterexample if needed.

7. Write the converse, inverse, and contrapositive of the conditional statement. Tell if each statement is true.

Conditional Statement: "If two angles are acute, then they are complementary."

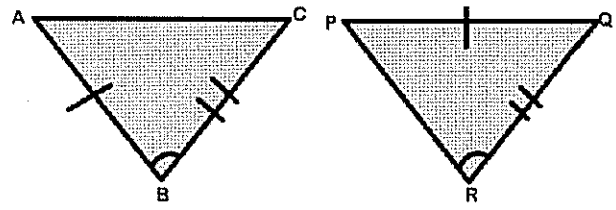
Objective: Identify errors or gaps in a mathematical argument and develop counterexamples to refute invalid statements about geometric relationships.

8. Show that the conjecture is false by finding a counterexample. If $a > b$, then $\frac{a}{b} > 0$.

A. $a = 11, b = -3$ B. $a = 11, b = 3$ C. $a = 3, b = 11$ D. $a = -11, b = 3$

2. Identify errors in reasoning in the following proof:

$\angle ABC \cong \angle PRQ$ $\overline{AB} \cong \overline{PQ}$ $\overline{BC} \cong \overline{QR}$	Given
$\Delta ABC \cong \Delta PQR$	SAS



A. The student mixed up the sides and should have said $\overline{AC} \cong \overline{PR}$ instead of saying $\overline{AB} \cong \overline{PQ}$ in order to conclude $\Delta ABC \cong \Delta PQR$ by SAS.

B. The student mixed up the angles and should have said $\angle ABC \cong \angle PQR$, instead of saying $\angle ABC \cong \angle PRQ$ in order to conclude $\Delta ABC \cong \Delta PQR$ by SAS.

C. The student needed to know that $\overline{AB} \cong \overline{PR}$ in order to conclude $\Delta ABC \cong \Delta PQR$ by SAS.

D. The student mixed up which triangles were congruent. Using the given information, $\angle ABC \cong \angle PRQ, \overline{AB} \cong \overline{PQ}, and\ \overline{BC} \cong \overline{QR}$ the student should have concluded $\Delta ABC \cong \Delta PRQ$.

Objective: Explain the role of definitions, undefined terms, postulates (axioms), and theorems.

9. **Define the following.**

Undefined terms

Definition

Postulate

Theorem

10. Which statement is an example of a defined term?

A. Through any two points, there is exactly one line.

B. All right triangles are congruent.

C. If two angles form a linear pair, then they are supplementary.

D. A polygon is a closed plane figure formed by three or more line segments.

11. Although the statement "if two points lie in a plane, then the lines containing those points lie in the plane" cannot be proven, it is agreed to be true. Which type of statement is this an example of?

A. Undefined term B. Definition C. Postulate (or axiom) D. Theorem

12. Which statement is a theorem?

A. An endpoint is a point at one end of a segment or the starting point of a ray.

B. If two angles are complementary to the same angle, then the two angles are congruent.

C. If two lines intersect, then they intersect in exactly one point.

D. A plane is a flat surface that has no thickness and extends forever.

EOC Review Day 2

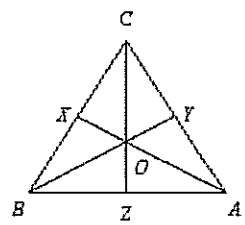
Triangles *(Everything except SOHCAHTOA!)*

Objective: Know and apply basic postulates and theorems about triangles and the special lines, line segments and rays associated with a triangle.

1. Triangle *JKE* is an obtuse isosceles triangle with $m\angle E = 10°$ and $KE > JK$.
What is the measure of $\angle J$?

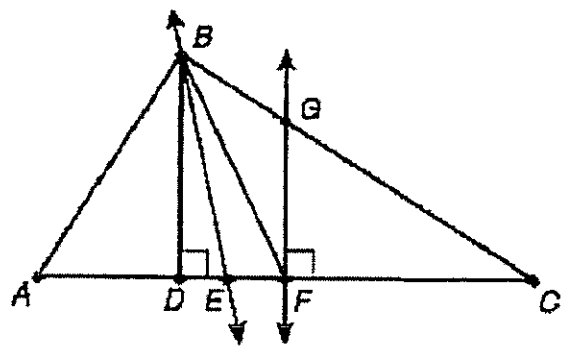
A. 170° B. 160° C. 85° D.10°

2. In ΔABC, Point O is the centroid. $BY = 18$. Find BO.



A. 6
B. 9
C. 12
D. 27

Use the diagram of ΔABC for numbers 3 thru 5.

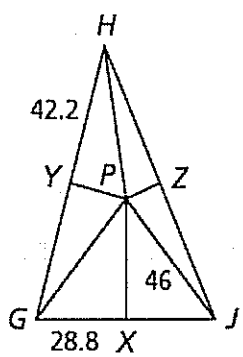


3. Given $\overline{AF} \cong \overline{FC}$, $\angle ABE \cong \angle EBC$
Which line is a perpendicular bisector in ΔABC? _____

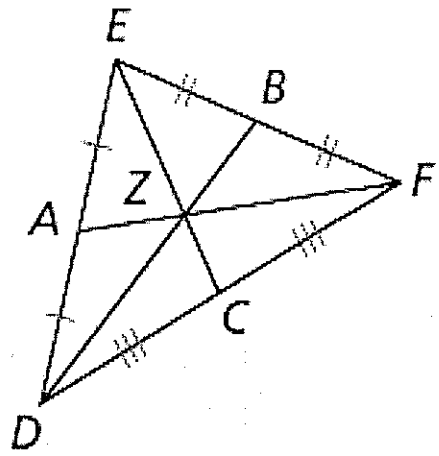
4. Given $\overline{AF} \cong \overline{FC}$, $\angle ABE \cong \angle EBC$
Which segment is a median of $\triangle ABC$? _____

5. Given $\overline{AF} \cong \overline{FC}$ $\angle ABE \cong \angle EBC$
An altitude of $\triangle ABC$ is _____

6. $\overline{PX}$, $\overline{PY}$ and $\overline{PZ}$ are perpendicular bisectors. Find the length of *PH*



7. In numbers 7 thru 10, use the diagram to the right.
In ΔDEF, $DB = 24.6$, and $EZ = 11.6$.
Find each length.



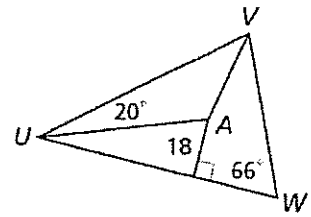
7. $DZ =$ _____

8. $ZB =$ _____

9. $ZC =$ _____

10. $EC =$ _____

8. $\overline{UA}$ and $\overline{VA}$ are angle bisectors. Find the shortest distance from A to $\overline{UV}$.



Objective: Determine and prove triangle congruence and other properties of triangles.

9. Name the five postulates of congruence AND the one that doesn't work.

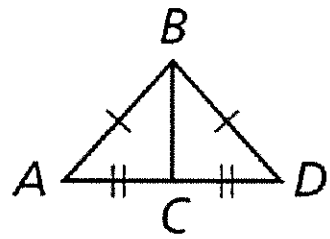
10. Which theorem or postulate can be used to prove that $\Delta ABC \cong \Delta DBC$?

A. SSS Congruence Postulate

B. SAS Congruence Postulate

C. ASA Congruence Postulate

D. HL Congruence Theorem



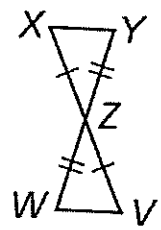
11. Which theorem or postulate can be used to prove that $\Delta XYZ \cong \Delta VWZ$?

A. SSS Congruence Postulate

B. SAS Congruence Postulate

C. ASA Congruence Postulate

D. SSA Congruence Theorem



12. Which theorem or postulate can be used to prove that $\Delta JKL \cong \Delta JML$?

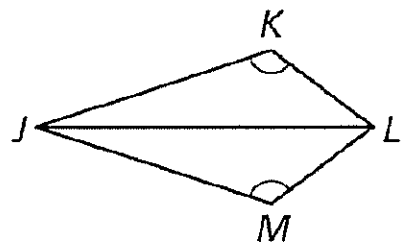
A. SSS Congruence Postulate

B. SAS Congruence Postulate

C. ASA Congruence Postulate

D. AAS Congruence Theorem

Given: JL bisects $\angle KLM$, $\angle K \cong \angle M$



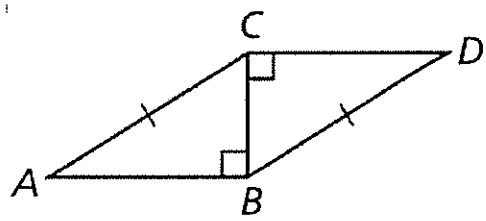
13. Which theorem or postulate can be used to prove that $\Delta ABC \cong \Delta DCB$?

A. SSS Congruence Postulate

B. SAS Congruence Postulate

C. ASA Congruence Postulate

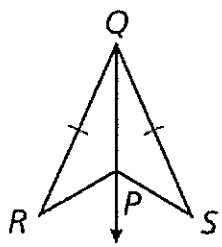
D. HL Congruence Theorem



14. Complete the proof by writing in the missing statement and reasons.

Given: $\overrightarrow{QP}$ bisects $\angle RQS$. $\overline{QR} \cong \overline{QS}$

Prove: $\Delta RQP \cong \Delta SQP$

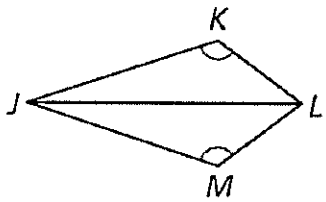


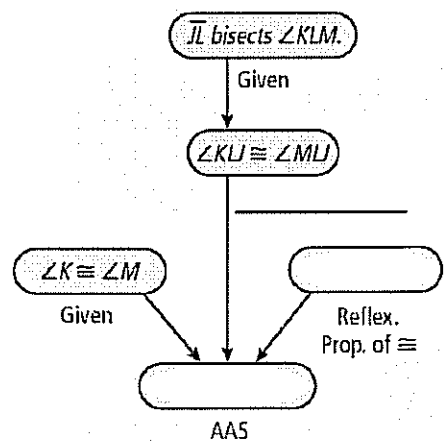
Statements	Reasons
1. $\overline{QR} \cong \overline{QS}$	1. Given
2. $\overrightarrow{QP}$ bisects $\angle RQS$	2. Given
3. _____	3. Def. of bisector
4. $\overline{QP} \cong \overline{QP}$	4. _____
5. $\Delta RQP \cong \Delta SQP$	5. _____

15. Complete the proof by writing in the missing statements and reason.

Given: $\overline{JL}$ bisects $\angle KLM$, $\angle K \cong \angle M$

Prove: $\Delta JKL \cong \Delta JML$





Objective: Use the properties of special right triangles (30°-60°-90° and 45°-45°-90°) to solve problems.

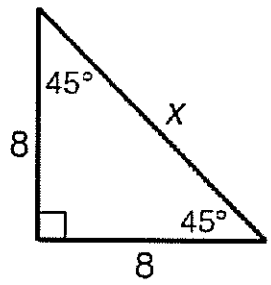
16. What is the value of x?

A. $2\sqrt{8}$ feet

B 8 feet

C. $8\sqrt{2}$ feet

D. 128 feet



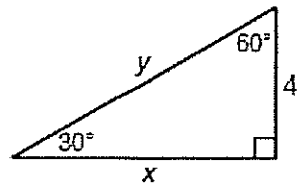
17. What is the value of y?

A. $3\sqrt{4}$ feet

B 4 feet

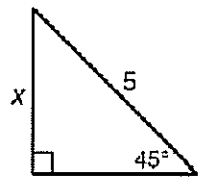
C. $4\sqrt{3}$ feet

D. 8 feet



18. What is the value of *x* in simplest radical form?

The value of x in simplest radical form is _____



19. The hypotenuse of an isosceles right triangle is 36 units. What is the approximate length of one of the legs?

A. 25.5 units B. 18 units C. 50.9 units D. 20.8 units

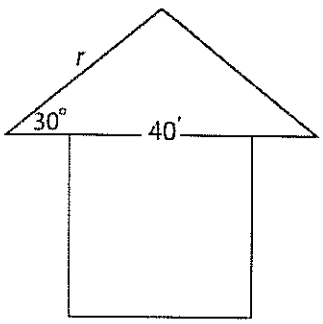
20. If one leg of a 30°–60°–90° triangle has a length of 6 and the adjacent angle is 30°, what is the exact length of the hypotenuse in simplest radical form?

A. $\frac{12}{\sqrt{3}}$ units B. $2\sqrt{3}$ units C. $4\sqrt{3}$ units D. $\frac{6}{\sqrt{3}}$ units

21. An equilateral triangle has side lengths of 10 feet. Find the length of the altitude $\overline{AB}$ of the triangle.

A. $10\sqrt{5}$ feet B $5\sqrt{10}$ feet C. $5\sqrt{3}$ feet D. 5 feet

22. The pitch of a symmetrical roof on a house 40 feet wide is 30º. What is the length of the rafter, *r*, exactly and approximately? Show your work using words, pictures or symbols.



The length of the rafter, r, is exactly _____ and approximately _____.

EOC Review Day 3

Pythagorean Theorem, SOHCAHTOA (for right triangles), and Quadrilaterals

Objective: Solve problems using the Pythagorean Theorem.

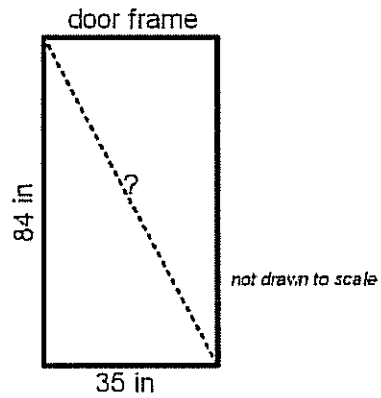
1. David is checking to make sure that a door frame he built has right angles. He measures the width on the floor to be 35 inches and the height to be 84 inches. To have right angles, what should be the length of the diagonal?

A. 76.4 inches

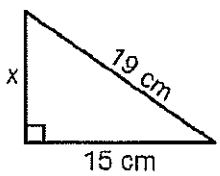
B. 91 inches

C. 119 inches

D. 238 inches



2. Find the length of side *x* of the right triangle. Round to the nearest to tenth.

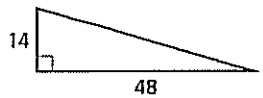


What is the length of side *x*? _____ cm

3. According to the recommended safety ratio of 4:1, (the ladder should be 4 inches away from the base of the wall for every 1 foot in height.) How high will a 30-foot ladder reach when placed against a wall? Round to the nearest inch.

A. 30 ft 3 in B. 29 ft 9 in C. 29 ft 1 in D. 7 ft 3 in

4. What is the length of the missing side of the triangle?



A. 31 B. 50 C. 62 D. 63

5. Alice drew four triangles and measured each side length. Which side lengths would form a right triangle?

A. 10 cm, 24 cm, 26 cm B. 5 cm, 12 cm, 15 cm C. 9 cm, 12 cm, 24 cm D. 3 cm, 4 cm, 6 cm

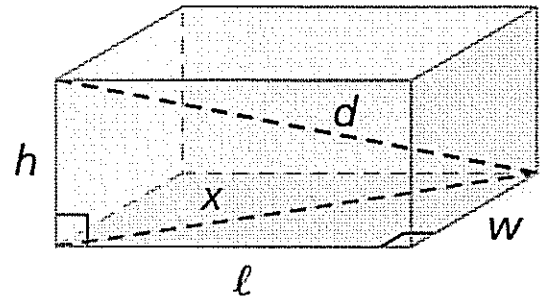
6. A box in the shape of a rectangular prism has a height (*h*) of 5 inches, a length (*l*) of 8 inches, and a width (*w*) of 1/2 a foot. What is the length of diagonal *(d)* to the nearest inch?

A. 11 inches

B. 10 inches

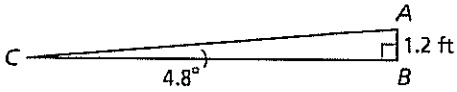
C. 9 inches

D. 8 inches



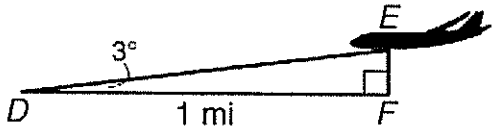
Objective: Solve problems involving the basic trigonometric ratios of sine, cosine, and tangent.

7. A contractor has been hired to construct a ramp and needs to calculate the overall length of the ramp CA. Find CA to the nearest tenth of a foot.



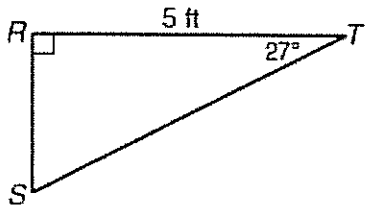
A. 1.6 ft. B. 14.3 ft. C. 48.2 ft. D. 5.8 ft.

8. A plane approaches Paine Field, and is 1 mile horizontel distance from landing. This plane approaches the landing at an angle of 3° with the ground. If 1 mile is 5280 feet, find the plane's altitude EF, to the nearest foot, when the plane is 1mile from landing.



A. 277 ft. B. 10,748 ft. C. 753 ft. D. 5,273 ft.

9. Find side length RS on the given triangle.



A. 4.5 ft. B. 2.3 ft. C. 2.5 ft. D. 9.8 ft.

10. Find the sine of the smaller acute angle in a triangle with side lengths of 8, 15, and 17.

A. 1.88 B. 0.47 C. 0.88 D. 0.53

11. The cosine of what angle is 0.5?

A. 50° B. 45° C. 60° D. 30°

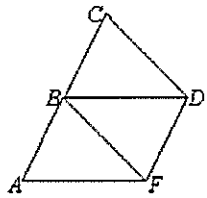
12. What must always be true for any angle between 0° and 90°?

A. $\sin^2_\theta - \cos^2_\theta = 1$ C. $\sin_\theta + \cos_\theta = 1$

B. $\sin^2_\theta + \cos^2_\theta = 1$ D. $\sin^2_\theta + \cos^2_\theta = -1$

Objective: Know, prove, and apply basic theorems about parallelograms.

13. A two-column proof is shown. Fill in the blanks for steps 2 and 4 to complete the proof.



Given: *ABDF* and *FBCD* are parallelograms
Prove: $\angle BCD \cong \angle ABF$

Statement	Reason
1. *ABDF* and *FBCD* are parallelograms.	1. Given
2. $\angle BCD \cong \angle DFB$	2. [1]
3. $\overline{DF} \parallel \overline{AB}$	3. Opposite sides in a parallelogram are parallel.
4. $\angle DFB \cong \angle ABF$	4. [2]
5. $\angle BCD \cong \angle ABF$	5. Substitution

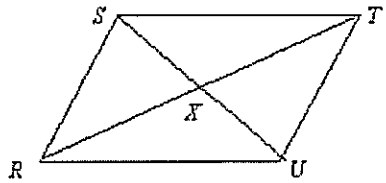
A. [1] In a parallelogram, opposite angles are congruent.
[2] Alternate Interior Angles Theorem

B [1] Vertical Angles Theorem
[2] Alternate Exterior Angles Theorem

C. [1] CPCTC
[2] In a parallelogram, opposite angles are congruent.

D. [1] In a parallelogram, consecutive angles are congruent.
[2] In a parallelogram, all angles are congruent.

14. The diagram shows the parallelogram-shaped component that attaches a car's rearview mirror to the car. In parallelogram *RSTU*, *UR* = 25, *RX* = 16, and



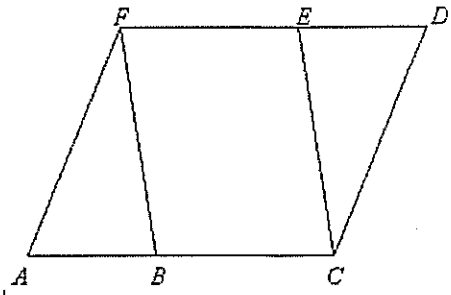
$m\angle STU = 42.4°$. Find *ST*, *XT*, and $m\angle RST$.

In parallelogram *RSTU*, *ST*= _____, *XT* = _____,
and $m\angle RST$ = _____,

15. Choose the statement that is NOT ALWAYS true. For any parallelogram, _____

A. opposite sides are congruent B diagonals bisect each other
C. diagonals are perpendicular D. opposite angles are congruent

16. A two-column proof is shown. Fill in the blanks for steps 2 and 3 to complete the proof.



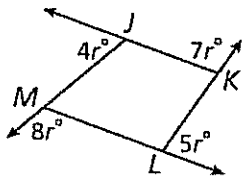
Given: ACDF is a parallelogram and $\overline{FB} \parallel \overline{EC}$
Prove: BCEF is a parallelogram

Statement	Reason
1. *ACDF* is a parallelogram, $\overline{FB} \parallel \overline{EC}$	1. Given
2. $\overline{AC} \parallel \overline{FD}$	2. _____
3. BCEF is a parallelogram	3. _____

Objective: Know, prove, and apply theorems about properties of quadrilaterals and other polygons.

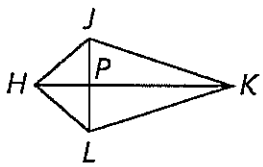
17. What is the sum of the interior angle measures of a polygon with 15 sides?
A. 1350° B. 2340° C. 2700° D. 3060°

18. Find the value of *r* in polygon *JKLM*.



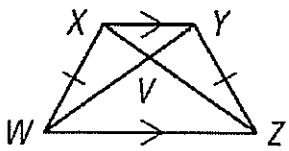
What is the value of *r*? _____

19. In kite *HJKL*, m∠*KLP* = 72°, and m∠*HJP* = 49.5°. What is *m*∠*LHJ*?



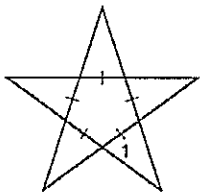
A. 18° B. 40.5° C. 81° D. 121.5°

20. In trapezoid *WXYZ*, *m*∠*WZY* = 61°. Find *m*∠*WXY*.



What is the *m*∠*WXY*? _____

21. Ann is making paper stars for party decorations. What is the measure of ∠1?



A. 72° B. 74° C. 108° D. 144°

EOC Review Day 4
Coordinate Plane Geometry, Measurement, and Units

Objective: Determine the coordinates of a point that is described geometrically.

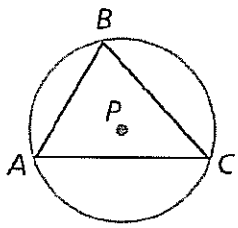
Find the coordinates of the midpoint of $\overline{AB}$ with endpoints A (-2, 6) and B (8, 0).

A. (-5, 3) B. (-1, 7) C. (7, -1) D. (3, 3)

L is the midpoint of $\overline{KM}$. K has coordinates (1, -7), and L has coordinates (9, 3). Find the coordinates of M.

A. (5, -2) B. (17 , 13) C. (7, -1) D. (3, -9)

3. Point P is the center of the circumscribed circle around ΔABC. Find the coordinates of point P given vertices $A(0, 0)$, $B(4, 8)$, and $C(12, 0)$.



A. (8, 2) B. (6 , 3) C. (5, 1) D. (6, 2)

4. Find the length of the radius of the described circle in Problem 3 above.

A. $2\sqrt{10}$ B. $3\sqrt{3}$ C. $2\sqrt{7}$ D. $2\sqrt{7}$

5. Three vertices of parallelogram $PQRS$ are $P(-3, -2)$, $Q(-1, 4)$, and $S(5, 0)$. Find the coordinates of vertex R.

A. (3, -7) B. (7, 6) C. (2, -6) D. (5, 6)

Objective: Apply properties of triangles and quadrilaterals in the coordinate plane.

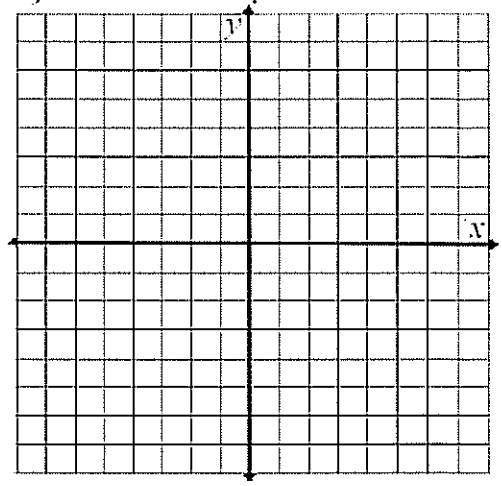
1. Two vertices for a right triangle are $(-4, 3)$ and $(5\ 5)$. Which is the possible third vertex?

A. $(-3, 1)$

B. $(0, 0)$

C. $(1, -3)$

D. $(4, 0)$



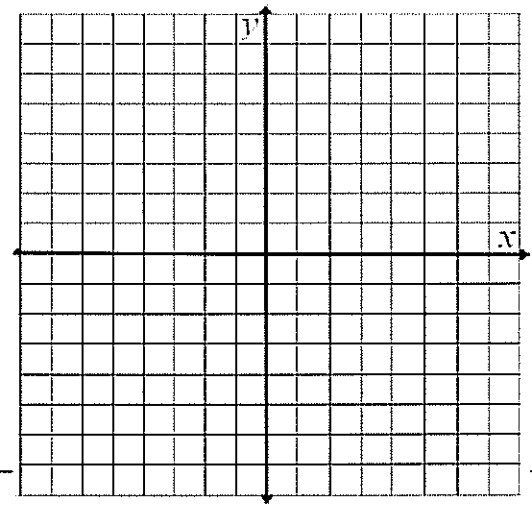
2. The vertices for ΔABC are $A(-4, -2)$, $B(-1, 6)$ and $C(2, -2)$. What type of triangle is ΔABC?

A. right triangle

B. scalene triangle

C. equilateral triangle

D. isosceles triangle



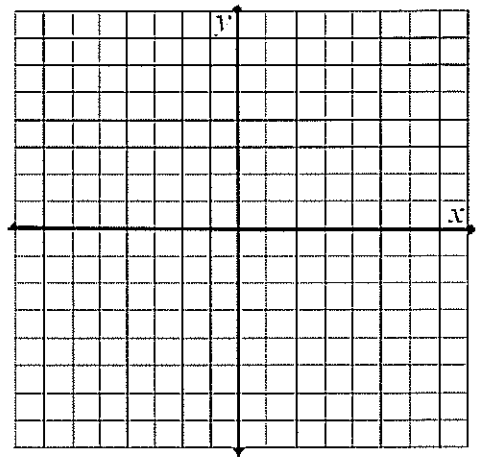
3. The vertices for quadrilateral *EFGH* are $E(-2, 5)$, $F(6, 8)$, $G(3, 0)$, and $H(-5, -3)$. What type of quadrilateral is *EFGH* ?

A. square

B. rhombus

C. rectangle

D. kite



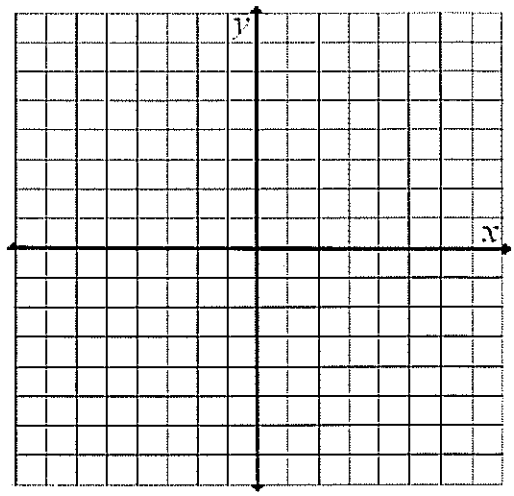
4. Two vertices for rectangle *JKLM* are $L(4, 3)$ and $M(2, -1)$. What are the possible coordinates of *J* and *K*?

A. $J(0, -1), K(2, 3)$

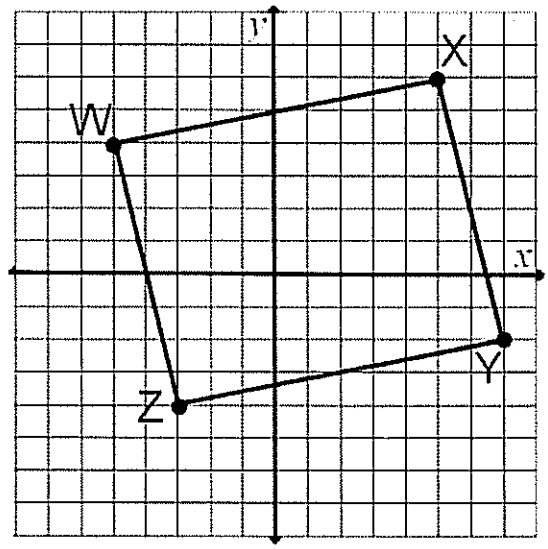
B. $J(-1, 0), K(1, 4)$

C. $J(0, 5), K(-2, 1)$

D. $J(0, 0), K(2, 4)$



5. Parallelogram WXYZ is shown on the coordinate grid. In the space below, verify that the diagonals of the parallelogram bisect each?



Objective: Use different degrees of precision in measurement, explain the reason for using a certain degree of precision, and apply estimation strategies to obtain reasonable measurements with appropriate precision for a given purpose.

1. To determine the volume of a traffic cone, its radius must be measured. What unit corresponds to the radius of a traffic cone?

A. cubic feet B square centimeter C. inch D. gram

2. The U.S. Census Bureau reported a national population of 299,894,924 on its Population Clock in mid-October of 2006. One can say that the U.S. population is 3 hundred million ($3 * 10^8$)and be precise to one digit. Although the population had surpassed 3 hundred million by the end of that month, explain why $3 * 10^8$ remained precise to one digit.

Objective: Solve problems using measurement conversions within and between systems, including those involving derived units, and analyze solutions in terms of reasonableness of solutions and appropriate units.

1. Given that 1 cm = 10 mm. How many mm^2 are in 15 cm^2 ?

   A. 0.15 mm^2 B. 1.5 mm^2 C. 150 mm^2 D. 1,500 mm^2

2. Given that 1 yd. = 3 ft. How many square yards are in 18 square feet?

   A. 2 yd^2 B. 3 yd^2 C. 6 yd^2 D. 54 yd^2

3. A 56 Kb computer modem took 4 hours and 9 minutes total to download a 100 Mb file. About how big was a file that was downloaded on the same modem if it only took 54 minutes to download?

   A. 24 Mb B. 134 Mb C. 2.6 Mb D. 22 Mb

4. An American tourist arrived in South Korea and went to the airport currency exchange office and exchanged a $100 US dollar bill for $ 1,125,110.00 South Korean WON money. The American then went to lunch and paid $ 258,775.30 WON. How much did the lunch cost in US dollars?

   A. $ 48 US B. $ 23 US C. $ 43 US D. $ 4 US

EOC Review Day 5
Quick Summary

1) (Sec 1.3) The endpoints of RS are R(1,-3) and S(4,2). Find the coordinates of the midpoint M.

Solution: (5/2, -1/2)

2) (Sec 1.3) The midpoint of JK is M(2,1). One endpoint is J(1,4). Find the coordinates of the endpoint K.

Solution: (3,-2)

3) (Sec 1.3) What is the approximate length of segment RS with endpoints R(2,3) and S(4,-1)?

Solution: sqrt(20), approx. 4.47

4) (Sec 1.7) What are the formulae for the perimeter and area of a rectangle of length *l* and width *w*?

Solution: Perimeter = $2l + 2w$; Area= lw.

5) (Sec 1.7) What are the formulae for the perimeter and area of a triangle of side lengths *a,b,c*, base *b*, and height (altitude) *h*?

Solution: Perimeter = a+b+c; Area = (1/2)bh.

6) (Sec 1.7) What are the formulae for the circumference and area of a circle of diameter *d* and radius *r*?

Solution: Circumference = 2*pi*r (or pi*d); Area = pi*r^2.

7) (Sec 1.7) How many square inches are in a square foot?

Solution: 144.

8) (Sec 1.7) How many square feet are in a square yard?

Solution: 9

9) (Sec 2.1) What is the next number in the series: -7,-21,-63,-189,…. Is this an example of inductive or deductive reasoning?

Solution: -567; inductive reasoning.

10) (Sec 2.2) Is the conditional statement "If the measure of angle A=99 degrees, then angle A is obtuse" true?

Solution: Yes; it is true.

11) (Sec 2.2) What is the converse of the conditional statement "If the measure of angle A=99 degrees, then angle A is obtuse." Is it a true statement?

Solution: "If angle A is obtuse, then the measure of angle A = 99 degrees." False.

12) (Sec 2.2) What is the inverse of the conditional statement in #10? Is it a true statement?

Solution: "If the measure of angle A is not 99 degrees, then angle A is not obtuse." False.

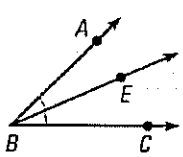
13) (Sec 2.2) What is the contrapositive of the conditional statement in #10? Is it a true statement?

Solution: "If angle A is not obtuse, then the measure of angle A is not 99 degrees." True.

14) (Sec 2.4) What is the difference between a postulate and a theorem? Give an example of each.

Solution: A postulate (or axiom) is accepted without proof, while a theorem can be proved. The Angle Addition Postulate, Segment Addition Postulate, and Linear Pair Postulate are all examples of postulates. The Hypotenuse-Leg Congruence Theorem is an example of a theorem.

15) (Sec 2.4) Sketch an acute angle, ABC, that is bisected by ray BE.

Solution: 

16) (Sec 3.2) Sketch a parallelogram ABCD and mark all parallel lines and congruent angles. Which angles are supplementary? Why?

Solution: In a parallelogram, opposite sides are congruent and parallel and opposite angles are congruent. Consecutive interior angles are supplementary due to the Consecutive Interior Angles Theorem (Theorem 3.3, p. 155).

17) (Sec 3.4) What is the relationship between the slopes of two parallel lines? Perpendicular lines?

Solution: The slopes of two parallel lines are the same. The product of the slopes of two perpendicular lines = -1 (negative reciprocal).

18) (Sec 3.4) Are the lines through the given points parallel or perpendicular?
Line 1: (-3,0), (-2,4)
Line 2: (3,1), (4,5)

Solution: The slope of line 1 and line 2 is +4, therefore the lines are parallel.

19) (Sec 4.1) What are the 3 ways to classify a triangle by its side lengths? Sketch an example of each.

Solution: Scalene triangle (no congruent sides), isosceles triangle (2+ congruent sides), equilateral triangle (3 congruent sides). (Drawing)

20) (Sec 4.1) What are the 4 ways to classify a triangle by its angle measures? Sketch an example of each.

Solution: Acute triangle (3 acute angles), Right triangle (1 right angle), obtuse triangle (1 obtuse angle), equiangular triangle (3 congruent angles; also equilateral). (Drawing)

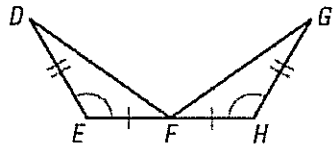
21) (Sec 4.1) One base angle in an isosceles triangle is 25 degrees. What are the measures of the other 2 angles? How would you classify this triangle by its angle measures?

Solution: The other two angles are 25 degrees and 130 degrees. The triangle is an obtuse isosceles triangle.

22) (Sec 4.1) Sketch a scalene triangle ABC and mark 1 exterior angle. What is the relationship between this exterior angle and the triangle's interior angles?

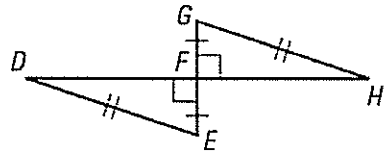
Solution: (Drawing) The exterior angle is equal to the sum of the two nonadjacent interior angles by the Exterior Angle Theorem (Th 4.2, p. 219).

23) (Sec 4.4) What congruence theorem would you use to prove that the two triangles are congruent? Write a congruence statement.



Solution: Side-Angle-Side (SAS) Congruence Postulate. Triangle DEF is congruent to triangle GHF.

24) (Sec 4.4) What congruence theorem would you use to prove that the two triangles are congruent? Write a congruence statement.

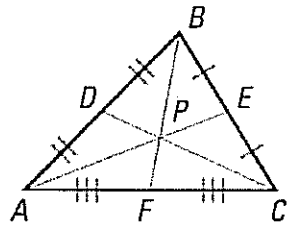


Solution: Hypotenuse-Leg (HL) Congruence Theorem. Triangle DEF is congruent to triangle HGF.

25) (Sec 4.3-4.5) What are the five postulates or theorems you can use to prove triangle congruence?

Solution: Side-Side-Side (SSS), Hypotenuse-leg (HL), Side-Angle-Side (SAS), Angle-Angle-Side (AAS), Angle-Side-Angle (ASA). SSA won't work. AA (or AAA) proves similarity, but does not prove congruence.

26) (Sec 5.4) What type of triangle center is located at point P?



Solution: Medians connect the side midpoints to the opposite vertex, therefore point P is a centroid or balancing point. AP = (2/3) AE, etc.

27) (Sec 6.4) How can you prove that two triangles are similar? What does similarity mean? Draw two similar triangles.

Solution: If two corresponding angle pairs are congruent (AA), then the triangles are similar. Similar triangles have congruent angles and proportional sides.

28) (Sec 7.1) If two legs of a right triangle are lengths 5 and 12, what is the length of the hypotenuse?

Solution: 13. (Note: 5,12,13 is a Pythagorean triple.)

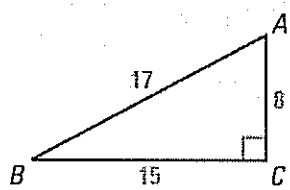
29) (Sec 7.2) Is the triangle with side lengths 10,11,14 acute, right, or obtuse?

Solution: Acute. 14^2 < 10^2 + 11^2. 196 < 100 + 121.

30) (Sec 7.4) Without using a calculator, determine the altitude (height) of an equilateral triangle whose side lengths measure 6 units. Keep your answer simplest radical form.

Solution: 3 * sqrt(3).

31) (Sec 7.5-7.6) Determine sin A, cos A, tan A.



Solution: sin A = 15/17; cos A = 8/17; tan A = 15/8.

32) (Sec 7.5) Using a calculator, determine the height of a lamppost 40 inches away from you whose angle of elevation (from the ground to the top of the lamppost) is 70 degrees.

Solution: h = 40 tan(70)= 109.9 inches.

33) (Sec 10.7) What geometric figure is described by the equation $(x+2)^2 + (y-4)^2 = 16$? What are the coordinates of the center of this figure?

Solution: The equation describes a circle with center P(-2,4). The radius is 4.

34) (Sec 11.1) What is the formula for the area of a parallelogram? Draw an example and label the important dimensions.

Solution: A = bh. (Drawing; base and height are perpendicular to each other.)

35) (Sec 11.6) What is the length of the apothem of a regular pentagon with side length 8 cm? What is the area of the pentagon?

Solution: The apothem is 4/tan(36) = 5.51cm. The area = (1/2)aP = (1/2)(5.51)(5*8)=110.11 cm^2.