

WASHINGTON STATE

END-OF-COURSE EXAM

GEOMETRY

Three different types of questions appear on this test:

Multiple-Choice Items	Completion Items	Short-Answer Items
<ul style="list-style-type: none"> Each Multiple-Choice item has four answer choices, the correct answer and three distractors. Multiple choice items are worth one point each. There will be 29 Multiple-Choice items assessing PEs common to Geometry/Integrated Mathematics 2. There will be 3-5 Multiple-Choice items assessing PEs common to Geometry/Integrated Mathematics 1 and Geometry/Integrated Mathematics 3. <p>NOTE: Enhanced Multiple-Choice items are scored as Short-Answer items.</p>	<ul style="list-style-type: none"> Each Completion item requires the student to enter a numerical answer, an expression with variables, or an equation with variables. Completion items are worth one point each. There will be 5 Completion items assessing PEs common to Geometry/Integrated Mathematics 2. There will be 1-3 Completion items assessing PEs common to Geometry/Integrated Mathematics 1 and Geometry/Integrated Mathematics 3. 	<ul style="list-style-type: none"> Each Short-Answer item requires a constructed response. A Short-Answer item may ask the student to write a sentence or equation; complete a table, graph, or chart; draw a picture; construct a diagram; or perform a calculation. An Enhanced Multiple-Choice item will ask the student to select from a list of four answer choices and then show work to support or explain the reason(s) for choosing that answer or to solve a problem. No more than two items on a test will be Enhanced Multiple-Choice items. Short-Answer items are worth two points each. There will be 3 Short-Answer items assessing PEs common to Geometry/Integrated Mathematics 2. Short-Answer items will not assess PEs common to Geometry/Integrated Mathematics 1 or Geometry/Integrated Mathematics 3.

While taking this test, remember:

1. Read each question carefully, including diagrams and graphs.
2. For multiple-choice questions, choose the best answer from the four choices given. Mark only one response for each multiple-choice question.
3. For short-answer questions, write your answers in the box provided. You do not have to use all of the space provided. Answers may be graphs, text, or calculations.
4. If a short-answer question asks you to show your work, you must do so to receive full credit. If you are using a calculator, describe the calculation process you used in enough detail to be duplicated, including the numbers you entered and the function keys you pressed to find the answer. If a short-answer item has multiple parts, label each section of work and clearly identify your answer for each part.

1. Seth was supposed to prove $\triangle ABC \cong \triangle PQR$ by SAS for his homework assignment. He wrote the following proof:

Given $\angle ABC \cong \angle PRQ$, $\overline{AB} \cong \overline{PQ}$, and $\overline{BC} \cong \overline{QR}$, then $\triangle ABC \cong \triangle PQR$ by SAS.

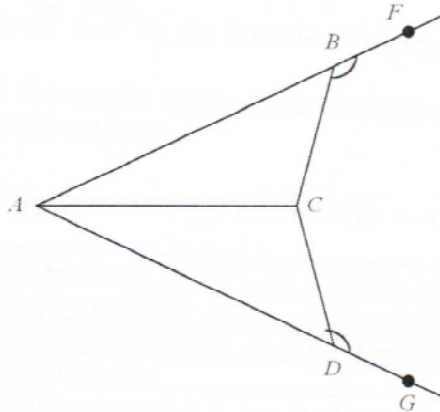
Which statement should be changed in order for Seth's proof to be correct?

- $\angle ABC \cong \angle PRQ$ should be rewritten as $\angle ABC \cong \angle PQR$.
 - $\overline{AB} \cong \overline{PQ}$ should be rewritten as $\overline{AB} \cong \overline{PR}$.
 - $\overline{BC} \cong \overline{QR}$ should be rewritten as $\overline{AC} \cong \overline{QR}$.
 - $\triangle ABC \cong \triangle PQR$ by SAS should be rewritten as $\triangle ABC \cong \triangle PQR$ by SSA.
2. Which of the following best describes a counterexample to the assertion below:

Two lines in a plane always intersect in exactly one point.

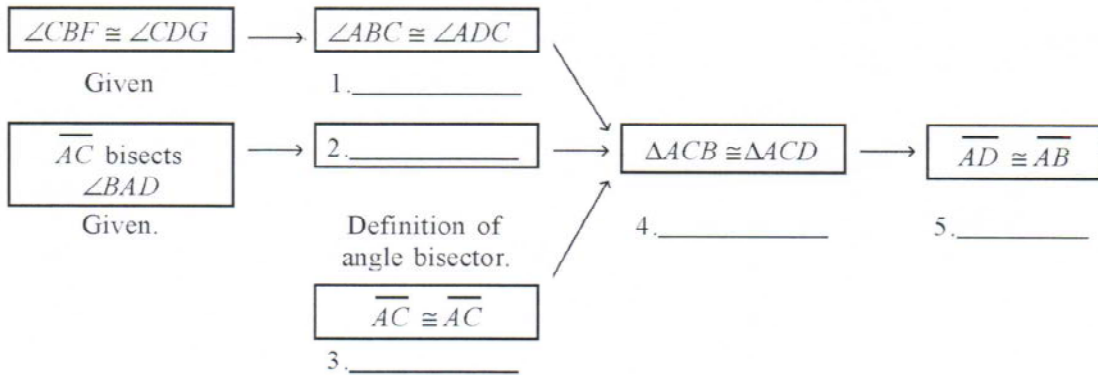
- Coplanar Lines
 - Intersecting Lines
 - Parallel Lines
 - Perpendicular Lines
3. Which of the following statements is true:
- A postulate is a proven fact using theorems, definitions, and undefined terms.
 - A theorem is a proven fact using postulates, definitions, and undefined terms.
 - Some defined geometric terms are line, plane, and point.
 - Some undefined geometry terms are angle, ray, and line segment.

4. Given: $\angle CBF \cong \angle CDG$, \overline{AC} bisects $\angle BAD$.
 Prove: $\overline{AD} \cong \overline{AB}$



Complete the flowchart proof.

Proof:



- | | |
|---|---|
| <p>a. 1. Congruent Complements Theorem
 2. $\angle ACB \cong \angle ACD$
 3. Transitive Property of Congruence
 4. CPCTC
 5. AAS</p> <p>b. 1. Congruent Supplements Theorem
 2. $\angle CAB \cong \angle CAD$
 3. Transitive Property of Congruence
 4. AAS
 5. CPCTC</p> | <p>c. 1. Congruent Supplements Theorem
 2. $\angle CAB \cong \angle CAD$
 3. Reflexive Property of Congruence
 4. AAS
 5. CPCTC</p> <p>d. 1. Congruent Complements Theorem
 2. $\angle ACB \cong \angle ACD$
 3. Reflexive Property of Congruence
 4. CPCTC
 5. AAS</p> |
|---|---|
5. If an indirect proof is used to prove the following theorem, then which assumption must be proved false?

If two lines form a pair of congruent corresponding angles, then the lines are parallel.

- | | |
|---|---|
| <p>a. The corresponding angles are congruent.</p> <p>b. The corresponding angles are not congruent.</p> | <p>c. The lines intersect.</p> <p>d. The lines do not intersect</p> |
|---|---|

6. Given the statement:

Conditional: *If the table top is rectangular, then its diagonals are congruent.*

The inverse of the conditional statement is:

Inverse: *If the diagonals of a table top are congruent, then it is rectangular.*

Identify by writing **yes/no** on the first line below if the statement above has correctly identified the inverse of the conditional. If the inverse above is incorrect, correctly write it in the space below.

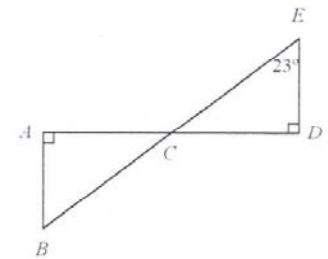
Inverse of Conditional

7. What is the name of the point of concurrency where the three angle bisectors of a triangle meet?

- | | |
|-----------------|----------------|
| a. Circumcenter | c. Centroid |
| b. Incenter | d. Orthocenter |

8. Given that $\triangle ABC \cong \triangle DEC$ and $m\angle E = 23^\circ$, find $m\angle ACB$.

- | | |
|-----------------------------|------------------------------|
| a. $m\angle ACB = 77^\circ$ | c. $m\angle ACB = 23^\circ$ |
| b. $m\angle ACB = 67^\circ$ | d. $m\angle ACB = 113^\circ$ |



9. Triangle JKE is an obtuse isosceles triangle with $m\angle E = 10^\circ$ and $KE > JK$.

What is the measure of $m\angle J$?

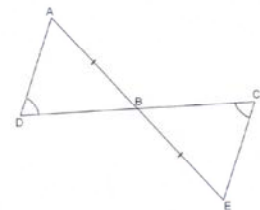
- | | |
|----------------|---------------|
| a. 170° | c. 85° |
| b. 160° | d. 10° |

10. In the diagram:

$$\overline{AB} \cong \overline{EB}$$

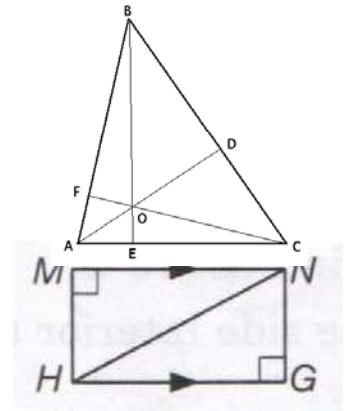
$$\angle ADB \cong \angle ECB$$

Prove $\triangle ABD \cong \triangle EBC$ using mathematical language and concepts.



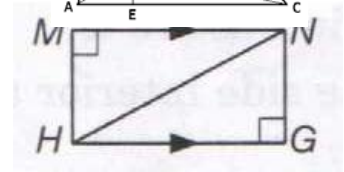
11. Choose the true statement based on knowing point O is the orthocenter of triangle ABC.

- a. $\angle BDA \cong \angle CDA$
- b. $\overline{BO} \cong \overline{CO}$
- c. $\angle BAD \cong \angle CAD$
- d. $\overline{EO} \cong \overline{FO}$



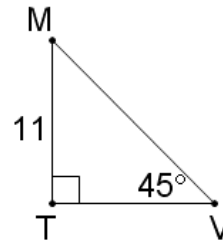
12. Which triangles are congruent in the diagram?

- a. $\triangle HMN \cong \triangle HGN$
- b. $\triangle HMN \cong \triangle NGH$
- c. $\triangle NMH \cong \triangle NGH$
- d. $\triangle MNH \cong \triangle HGN$



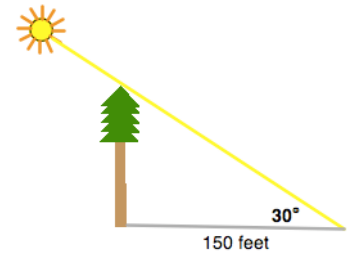
13. Find the length of side TV.

- a. 11
- b. $11\sqrt{2}$
- c. $11\sqrt{3}$
- d. 22



14. A tree casts a shadow that is 150 feet long. If the angle of elevation from the tip of the shadow to the top of the tree is 30° , how tall is the tree to the nearest foot?

- a. 87 feet
- b. 106 feet
- c. 212 feet
- d. 259 feet

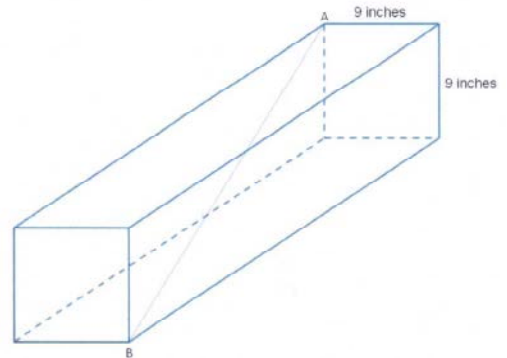


15. A rectangular prism is shown. The base of the prism is a square. The length of the diagonal from top corner A to opposite bottom corner B is 2 feet.

Determine the exact length of the box in inches.

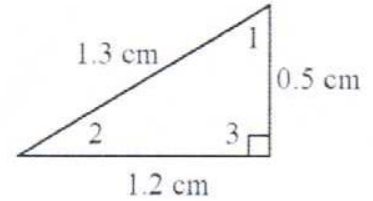
Write your answer on the line.

What is the exact length of the box?
 _____ inches

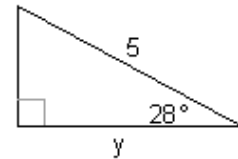


16. Which side lengths represent the sides of a right triangle?
- a. 1, 1, 2
 - b. 2, 3, 5
 - c. 5, 12, 13
 - d. 7, 23, 25

17. Use the trigonometric ratio $\sin A = 0.38$ to determine which angle of the triangle is $\angle A$.



- a. $\angle 2$
 - b. $\angle 1$
 - c. $\angle 3$
 - d. No Solution
18. Find the value of y .
- a. $y = 5 \sin 28^\circ$
 - b. $y = 5 \cos 28^\circ$
 - c. $y = 5 \cos 62^\circ$
 - d. $y = 5 \sin 62^\circ$
 - e.

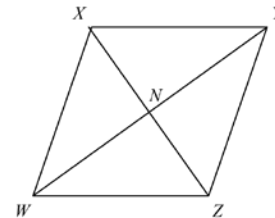


19. At takeoff, a plane flies at an angle of 10° with the runway. After it has traveled a ground distance of 2,800 feet, find the vertical distance the plane has gained from takeoff. Round your answer to the nearest foot.

- a. 486 feet
 - b. 494 feet
 - c. 2,757 feet
 - d. 15,880 feet
20. In parallelogram PQRS the measures of angle P and angle R are each 146° . What is the measure of angle Q?

- a. 146°
 - b. 112°
 - c. 68°
 - d. 34°
21. Which statement can you use to conclude that quadrilateral XYZW is a parallelogram?

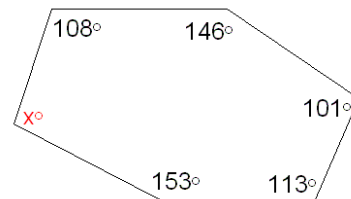
- a. $\overline{XW} \cong \overline{YZ}$ and $\overline{XY} \cong \overline{WZ}$
- b. $\overline{XW} \cong \overline{WZ}$ and $\overline{XY} \cong \overline{WZ}$
- c. $\overline{YN} \cong \overline{NX}$ and $\overline{XN} \cong \overline{NY}$
- d. $\overline{XW} \cong \overline{YZ}$ and $\overline{XY} \cong \overline{YZ}$



22. Which description does NOT guarantee that a quadrilateral is a parallelogram?
- a. A quadrilateral with both pairs of opposite sides congruent.
 - b. A quadrilateral with the diagonals bisecting each other.
 - c. A quadrilateral with consecutive angles supplementary.
 - d. Quadrilateral with two opposite sides parallel.

23. In the following polygon, determine the value of x .

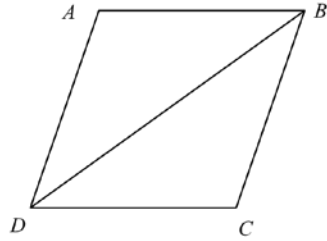
- a. 78
- b. 81
- c. 95
- d. 99



24. One exterior angle of a regular polygon measures 97° . What is the measure of one interior angle?
- a. 7°
 - b. 83°
 - c. 173°
 - d. 263°

25. What is the missing reason for the proof?

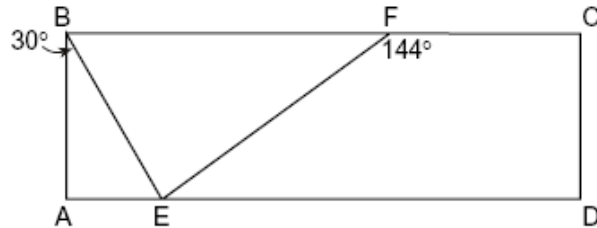
Given: Parallelogram ABCD with diagonal \overline{BD}
Prove: $\triangle ABD \cong \triangle CDB$



Statements	Reasons
1. $\overline{AD} \parallel \overline{BC}$	1. Definition of parallelogram
2. $\angle ADB \cong \angle CBD$	2. Alternate Interior Angles Theorem
3. $\overline{AB} \parallel \overline{CD}$	3. Definition of parallelogram
4. $\angle ABD \cong \angle CDB$	4. Alternate Interior Angles Theorem
5. $\overline{DB} \cong \overline{DB}$	5. Reflexive Property of Congruence
6. $\triangle ABD \cong \triangle CDB$	6. ?

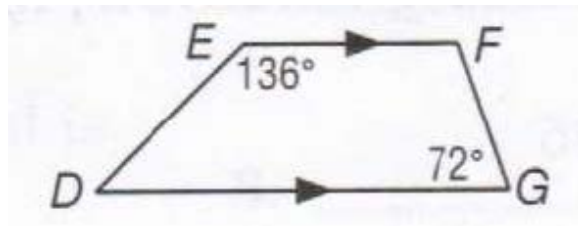
- a. Reflexive Property of Congruence
 - b. ASA
 - c. Alternative Interior Angles Theorem
 - d. SSS
26. In the accompanying diagram of rectangle ABCD, $m\angle ABE = 30$ and $m\angle CFE = 144$. Find $m\angle BEF$.

- a. 36°
- b. 60°
- c. 84°
- d. 90°



27. In trapezoid DEFG, find $m\angle D$.

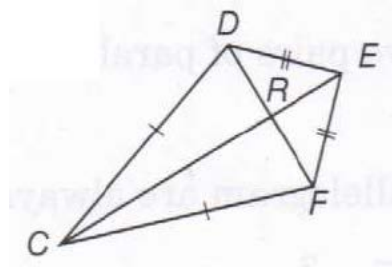
- a. 44
- b. 72
- c. 108
- d. 136



28. Which of the following statements is always true of any rhombus ABCD?

- a. $\angle A \cong \angle B$
- b. $AB \perp BC$
- c. $\overline{AC} \cong \overline{BD}$
- d. $AC \perp BD$

29. In kite DEFC, if $m\angle DCF = 20$ and $m\angle DEF = 80$, find $m\angle CDE$.



Write your answer on the line below

$m\angle CDE =$ _____

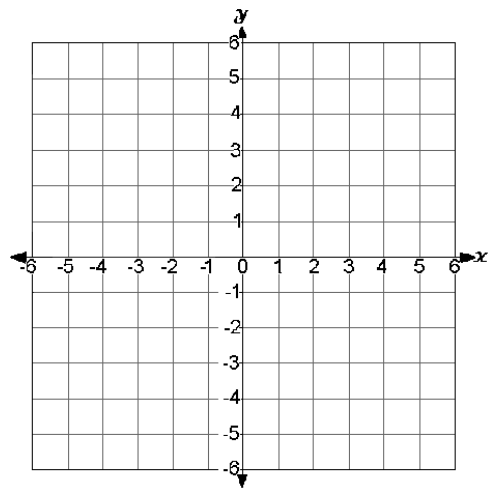
30. The vertices of a square are (3, 1), (-2, 0), (-1, -5), and (4, -4). The diagonals of the square intersect at point Q.

Determine the coordinates of point Q.

You may use the blank grid to help determine the solution.

Write your answer on the line.

What are the coordinates of point Q? (_____, _____)



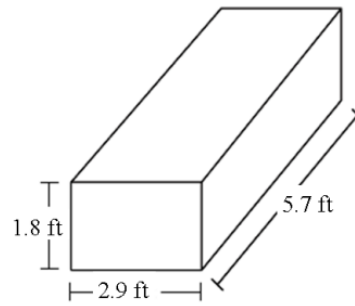
31. Isosceles triangle ABC has vertices at A(0, 0), B(8, 0), and C(x, 12).

The value of x could be:

- | | |
|------|-------|
| a. 4 | c. 12 |
| b. 8 | d. 16 |
32. What is the most precise name for a quadrilateral with vertices (-4, -1), (1, -1), (4, 3), and (-1, 3)?
- | | |
|------------------|--------------|
| a. Kite | c. Trapezoid |
| b. Parallelogram | d. Rhombus |
33. 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.

34. What is the best estimate for the surface area of the prism?

- a. 34 ft^2 c. 72 ft^2
 b. 48 ft^2 d. 96 ft^2



35. Convert 20 miles/hour to meters/second (round to the nearest meter).

$$1 \text{ mile} = 5,280 \text{ feet}$$

$$1 \text{ foot} = .3048 \text{ meters}$$

Write your answer on the line below.

20 miles/hour = _____ meters/second

36. There are 5 horses on 12 acres of land. What is the mean number of square yards per horse?

$$1 \text{ acre} = 43,560 \text{ square feet}$$

- a. 8,712 square yards
 b. 11,616 square yards
 c. 34,848 square yards
 d. 58,080 square yards

37. On a coordinate grid, a grocery store is located at (3,0) and the hardware store is located at (4,3). If the hardware store is the midpoint between the grocery store and the pharmacy, what is the approximate distance from the hardware store to the pharmacy? (Note: 1 unit equals 1 mile)

- a. 1.5 miles
 b. 1.58 miles
 c. 3.16 miles
 d. 3.5 miles

NAME: _____

GEOMETRY END-OF-COURSE EXAM PRACTICE TEST
Answer Key

Problem Number	Answer	Standard	Problem Number	Answer	Standard
1	A	G.1.E	20	D	G.3.F
2	C	G.1.E	21	A	G.3.F
3	B	G.1.E	22	D	G.3.F
4	C	G.1.C	23	D	G.3.G
5	B	G.1.C	24	B	G.3.G
6	No If the table top is not rectangular, then the diagonals are not congruent.	G.1.D	25	B	G.3.G
7	B	G.3.A	26	C	G.3.G
8	B	G.3.A	27	A	G.3.G
9	B	G.3.A	28	D	G.3.G
10	The vertical angles theorem states that angle ABD is congruent to angle CBE, therefore Triangle ABD is congruent to triangle EBC by Angle-Angle-Side Postulate	G.3.B	29	130 degrees	G.3.G
11	A	G.3.A	30	(1, -2)	G.4.B
12	B	G.3.B	31	A	G.4.C
13	A	G.3.C	32	D	G.4.C
14	A	G.3.C	33	Short Answer	G.6.E
15	20.3	G.3.D	34	C	G.4.E
16	C	G.3.D	35	8.94	G.6.F
17	A	G.3.E	36	B	G.6.F
18	B or D	G.3.E	37	C	G.6.F
19		G.3.E			

SCALE SCORE: / 40