WASHINGTON STATE

END-OF-COURSE EXAM

GEOMETRY PRACTICE TEST

Name: _____

Date: _____

GENERAL DIRECTIONS

Today you will be taking a Washington State Geometry End-of-Course Practice Test. To complete this test, you will need to use the answer document provided with this practice test on page 22. This practice test is designed to simulate the Washington State Geometry testing experience.

Three different types of questions appear on this test:

Multiple-Choice Items	Completion Items	Short-Answer Items
• 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. NOTE: Enhanced Multiple-Choice items are scored as Short-Answer items.	• 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.	• 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 I 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.

5. Record all multiple-choice and completion answers on the answer key located on page 22.

A formula sheet is provided for the Geometry End-of-Course Exam, and is provided on Page 20 and 21 of this Practice Test.

The Practice Test will be broken up into 3 different sections and will be completed in one sitting that will last approximately 150 minutes (there is no time limit):

Section 1: Questions 1-6
* **Logical arguments and proof**

Section 2: Questions 7-29
* **Proving and applying properties of 2-dimensional figures**

Section 3: Questions 30-37
* **Figures in a coordinate plane and measurement**

* Be sure to answer all questions before you end each test session. However, do not spend too much time on any one question.

* If you do not know the answer to a question, make your best guess and go on to the next question.

* You will ***not*** be penalized for guessing.

GEOMETRY END-OF-COURSE EXAM: PRACTICE TEST

1. Seth was supposed to prove $\Delta ABC \cong \Delta PQR$ 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 $\Delta ABC \cong \Delta PQR$ by SAS.

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

   a. $\angle ABC \cong \angle PRQ$ should be rewritten as $\angle ABC \cong \angle PQR$.
   b. $\overline{AB} \cong \overline{PQ}$ should be rewritten as $\overline{AB} \cong \overline{PR}$.
   c. $\overline{BC} \cong \overline{QR}$ should be rewritten as $\overline{AC} \cong \overline{QR}$.
   d. $\Delta ABC \cong \Delta PQR$ by SAS should be rewritten as $\Delta ABC \cong \Delta PQR$ by SSA.

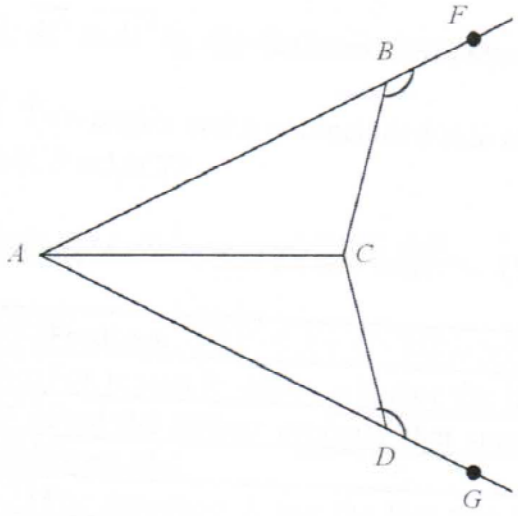
2. Which of the following best describes a counterexample to the assertion below:

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

   a. Coplanar Lines
   b. Intersecting Lines
   c. Parallel Lines
   d. Perpendicular Lines

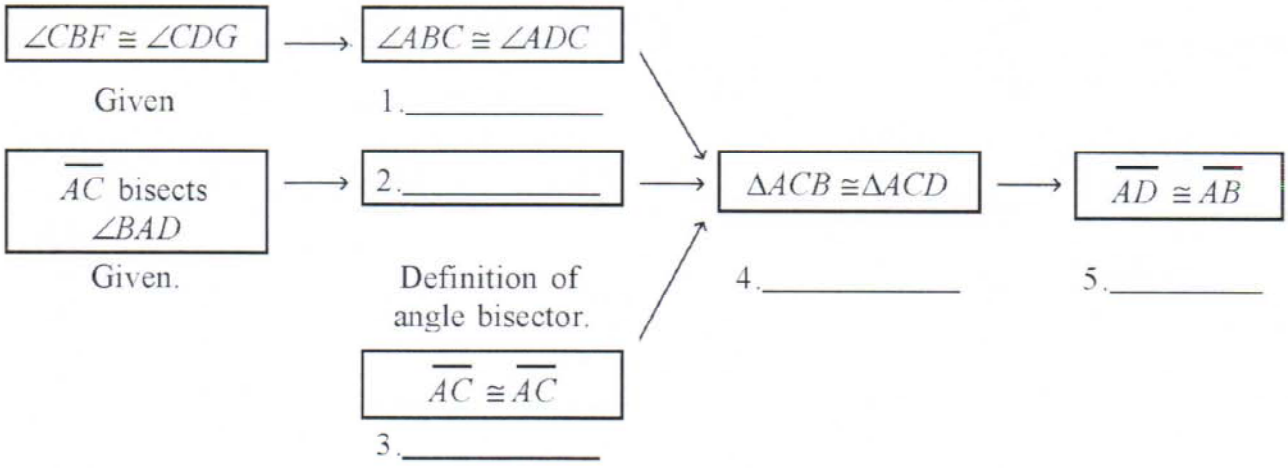
3. Which of the following statements is true:
   a. A postulate is a proven fact using theorems, definitions, and undefined terms.
   b. A theorem is a proven fact using postulates, definitions, and undefined terms.
   c. Some defined geometric terms are line, plane, and point.
   d. Some undefined geometry 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:



a. 1. Congruent Complements Theorem
2. $\angle ACB \cong \angle ACD$
3. Transitive Property of Congruence
4. CPCTC
5. AAS

b. 1. Congruent Supplements Theorem
2. $\angle CAB \cong \angle CAD$
3. Transitive Property of Congruence
4. AAS
5. CPCTC

c. 1. Congruent Supplements Theorem
2. $\angle CAB \cong \angle CAD$
3. Reflexive Property of Congruence
4. AAS
5. CPCTC

d. 1. Congruent Complements Theorem
2. $\angle ACB \cong \angle ACD$
3. Reflexive Property of Congruence
4. CPCTC
5. AAS

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.

a. The corresponding angles are congruent.
b. The corresponding angles are not congruent.
c. The lines intersect.
d. The lines do not intersect.

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

_____

_____

_____

_____

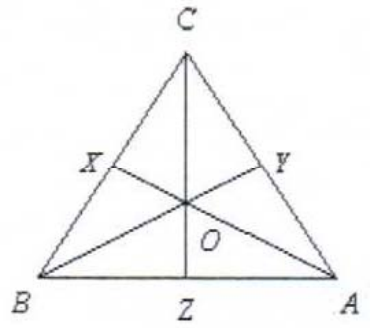
_____

_____

_____

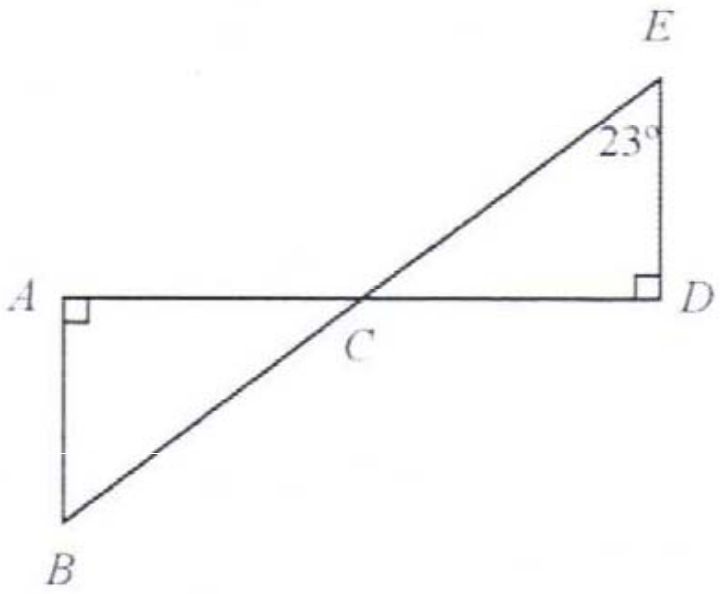
_____

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



   a. 6
   b. 9
   c. 12
   d. 27

8. Given that $\Delta ABC \cong \Delta DEC$ and $m\angle E = 23°$, find $m\angle ACB$.



   a. $m\angle ACB = 77°$
   b. $m\angle ACB = 67°$
   c. $m\angle ACB = 23°$
   d. $m\angle ACB = 113°$

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

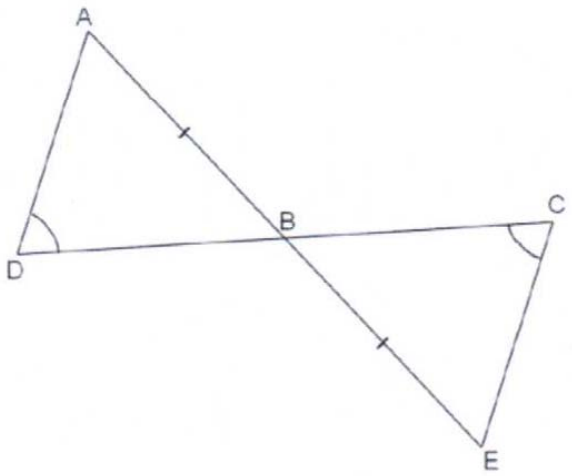
   Which of the following is a possible measure of $\angle J$?

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

10. In the diagram:

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

$\angle ADB \cong \angle ECB$



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

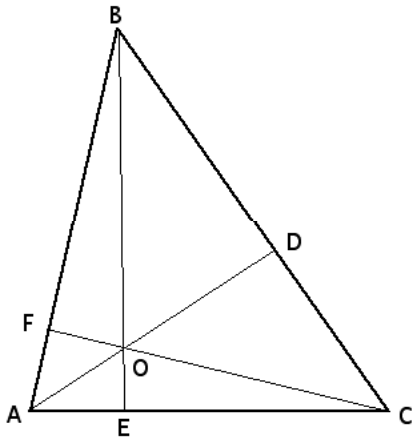
11. Choose the true statement based on knowing point O is the orthocenter of triangle ABC.

a. $\angle BDA \cong \angle CDA$

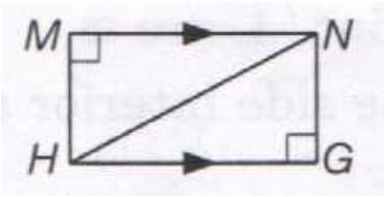
b. $\overline{BO} \cong \overline{CO}$

c. $\angle BAD \cong \angle CAD$

d. $\overline{EO} \cong \overline{FO}$



12. Which triangles are congruent in the diagram?



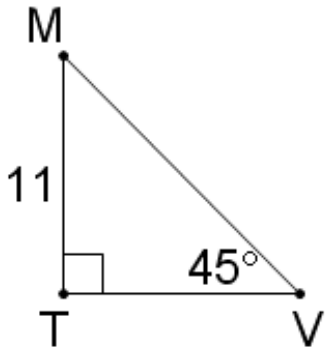
a. ΔHMN ≅ ΔHGN

b. ΔHMN ≅ ΔNGH

c. ΔNMH ≅ ΔNGH

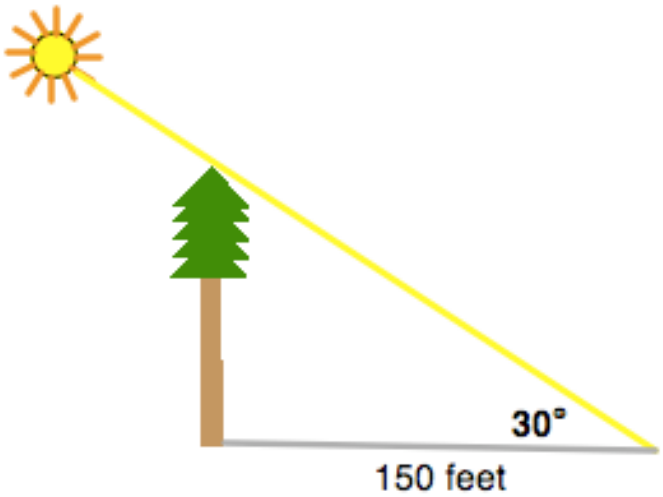
d. ΔMNH ≅ ΔHGN

13. Find the length of side TV.



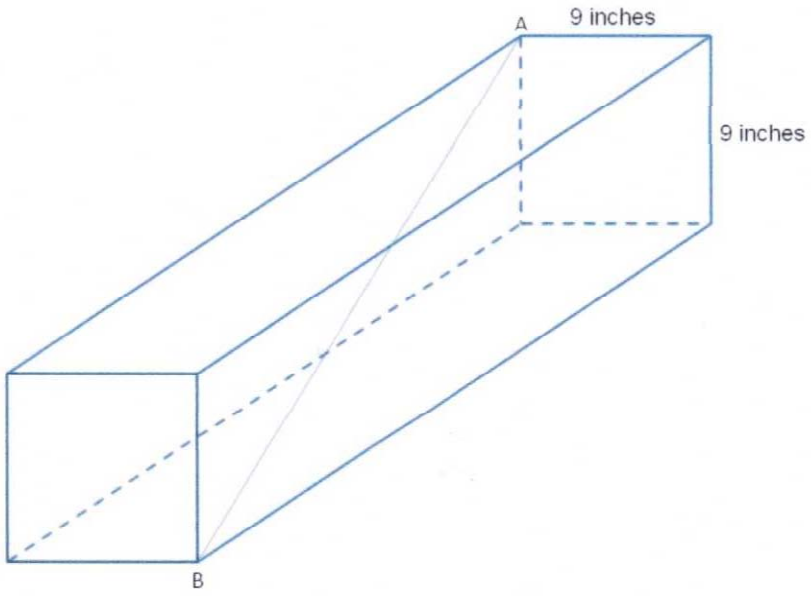
a. 11
b. $11\sqrt{2}$
c. $11\sqrt{3}$
d. 22

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.

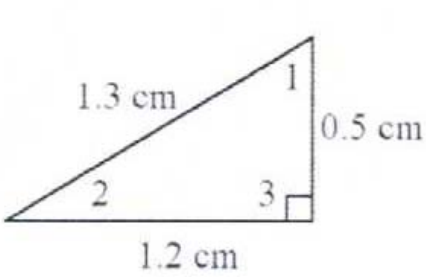
Write your answer on the line.

What is the exact length of the box? _____ inches

16. Which side lengths represent the sides of a right triangle?

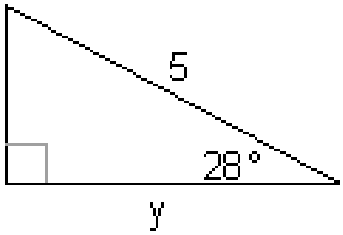
a. 1, 1, 2
b. 2, 3, 5
c. 5, 12, 13
d. 7, 23, 25

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. $y = 5\sin 28°$
b. $y = 5\sin 28°$
c. $y = 5\cos 62°$
d. $y = 5\sin 62°$

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°

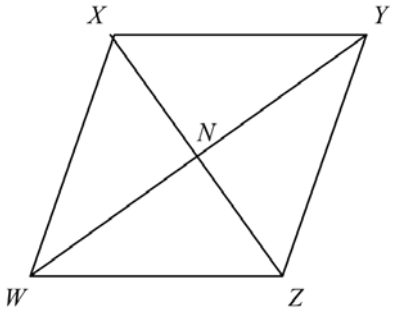
21. Which statement can you use to conclude that quadrilateral XYZW is a parallelogram?

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.

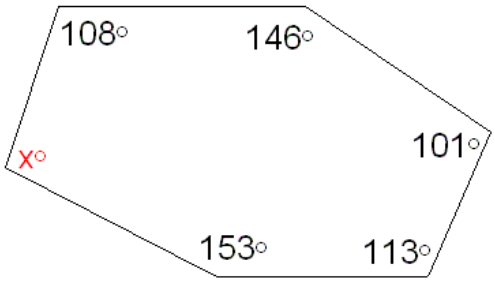
23. In the following polygon, determine the value of x.

a. 78

b. 81

c. 95

d. 99



24. What is the sum of the exterior angles of a polygon?

a. 180°

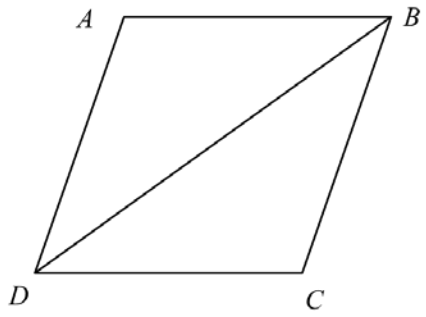
b. 360°

c. 540°

d. 720°

25. What is the missing reason for the proof?

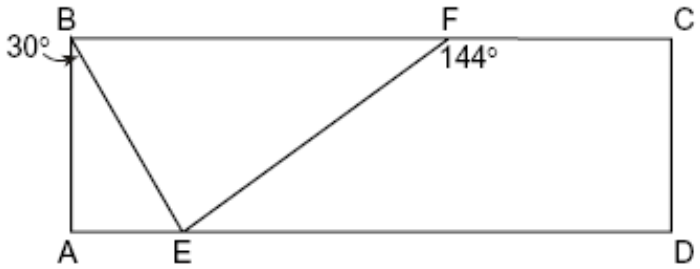
Given: Parallelogram ABCD with diagonal $\overline{BD}$
Prove: $\Delta ABD \cong \Delta CDB$



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. $\Delta ABD \cong \Delta CDB$	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°

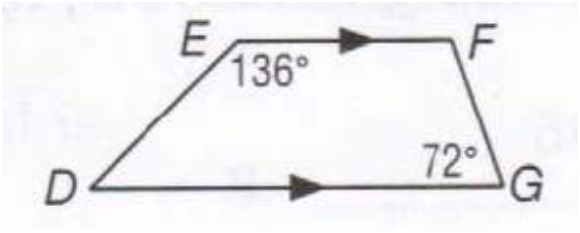
27. In trapezoid DEFG, find $m\angle D$.

a. 44

b. 72

c. 108

d. 136



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

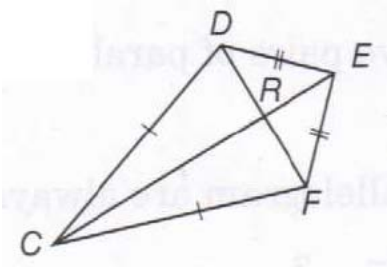
a. $\angle A \cong \angle B$

b. $AB \perp BC$

c. $\overline{AC} \cong \overline{BD}$

d. $AC \perp BD$

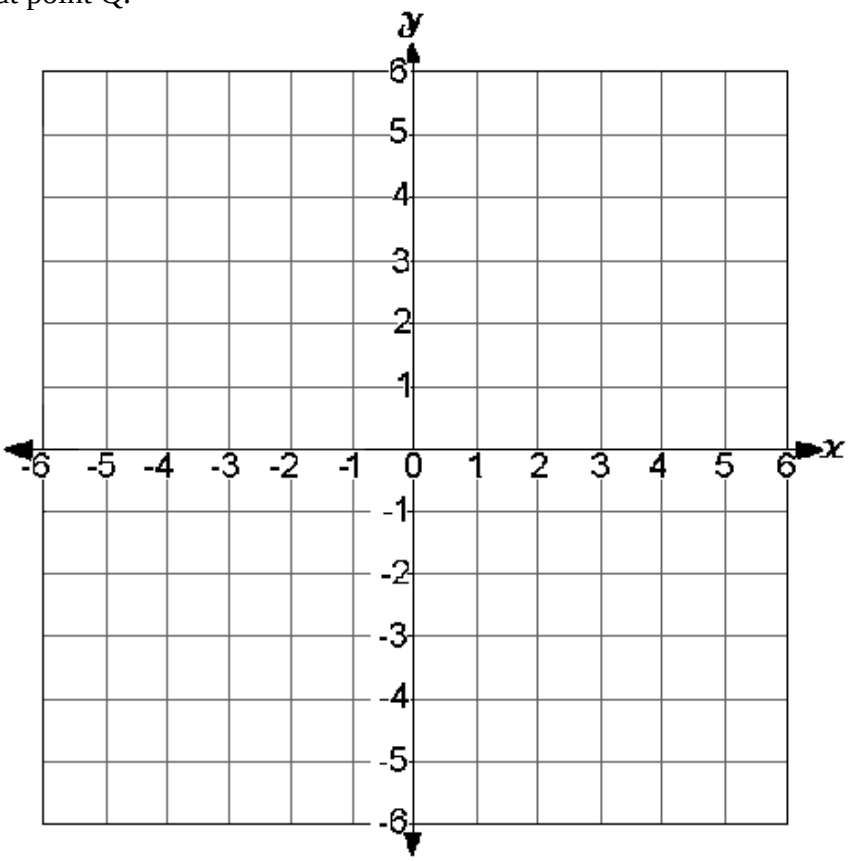
29. In kite DEFC, if $m\angle DCF = 20$ and $m\angle DEF = 80$, find $m\angle CDE$.



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
b. 8
c. 12
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

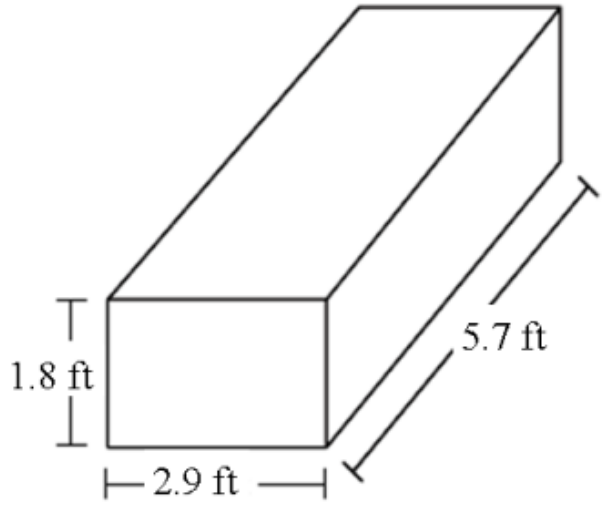
    b. Parallelogram

    c. Trapezoid

    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
b. 48 ft^2
c. 72 ft^2
d. 96 ft^2

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

1 mile = 5,280 feet
1 foot = .3048 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 acre = 43,560 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

Mathematics Formula Sheets for End-of-Course Exams

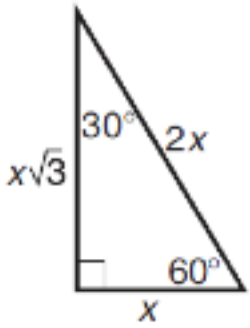
Use at least two decimal place values when approximating square roots or trigonometric ratios.

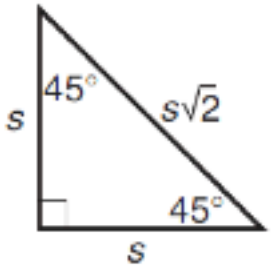
Description	Formula	Variables
Arc Length	$L = \frac{m\overset{\frown}{BC}}{360^\circ}\pi d$	L: Arc Length B, C: endpoints of arc d: diameter of the circle m: the measure of
Area of Sector	$A = \frac{m\overset{\frown}{BC}}{360^\circ}\pi r^2$	A: Area of Sector B, C: endpoints of intercepted arc r: radius of the circle m: the measure of
Cylinder	$SA = 2\pi r^2 + 2\pi rh$	SA: Surface Area r: radius of the base h: height
	$V = \pi r^2 h$	V: Volume r: radius of the base h: height
Cone	$SA = \pi r^2 + \pi rl$	SA: Surface Area r: radius of the base l: slant height
	$V = \frac{1}{3}Bh$ or $V = \frac{1}{3}\pi r^2 h$	V: Volume r: radius of the base h: height B: area of the base
Prism	$V = Bh$	V: Volume B: area of the base H: height
	$SA = 2B + Ph$ or $SA = 2B + L$	SA: Surface Area B: area of the base P: Perimeter of the base h: height L: lateral surface area
Pyramid	$V = \frac{1}{3}Bh$	V: Volume B: area of the base h: height
Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	x: solution a, b, c: coefficients
Sphere	$V = \frac{4}{3}\pi r^3$	V: Volume r: radius
	$SA = 4\pi r^2$	SA: Surface Area r: radius

Mathematics Formula Sheets for End-of-Course Exams

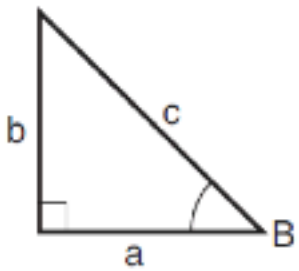
Use at least two decimal place values when approximating square roots or trigonometric ratios.

Special Right Triangles





Trigonometric Ratios



$$\sin B = \frac{b}{c}$$

$$\cos B = \frac{a}{c}$$

$$\tan B = \frac{b}{a}$$

NAME: _____

GEOMETRY END-OF-COURSE EXAM PRACTICE TEST

Answer Key

Problem Number	Answer	Standard
1		G.1.E
2		G.1.E
3		G.1.E
4		G.1.C
5		G.1.C
6	Short Answer	G.1.D
7		G.3.A
8		G.3.A
9		G.3.A
10	Short Answer	G.3.B
11		G.3.A
12		G.3.B
13		G.3.C
14		G.3.C
15		G.3.D
16		G.3.D
17		G.3.E
18		G.3.E
19		G.3.E

Problem Number	Answer	Standard
20		G.3.F
21		G.3.F
22		G.3.F
23		G.3.G
24		G.3.G
25		G.3.G
26		G.3.G
27		G.3.G
28		G.3.G
29		G.3.G
30		G.4.B
31		G.4.C
32		G.4.C
33	Short Answer	G.6.E
34		G.4.E
35		G.6.F
36		G.6.F
37		G.6.F

SCALE SCORE: / 40