

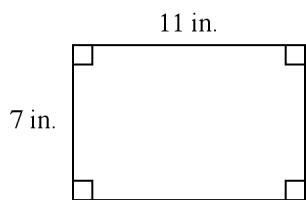
**Geometry Diagnostic Test****Multiple Choice**

Identify the letter of the choice that best completes the statement or answers the question.

- \_\_\_\_\_ 1. Which expression is NOT equal to the other three expressions?  
 a.  $\frac{2}{\tan \theta}$       b.  $\frac{\sin \theta}{\frac{1}{2} \cos \theta}$       c.  $\frac{\cot \theta}{\frac{1}{2}}$       d.  $\frac{2 \cos \theta}{\sin \theta}$
- \_\_\_\_\_ 2. Which equation is NOT true?  
 a.  $\cos^2 \theta = 1 - \sin^2 \theta$       c.  $\tan^2 \theta = \sec^2 \theta - 1$   
 b.  $\cot^2 \theta = \csc^2 \theta - 1$       d.  $\sin^2 \theta = \cos^2 \theta - 1$
- \_\_\_\_\_ 3. 9 ft = ■ in.  
 a. 90      b. 27      c. 36      d. 108
- \_\_\_\_\_ 4. 0.44 km<sup>2</sup> = ■ m<sup>2</sup>  
 a. 4.4      b. 440      c. 0.044      d. 440,000

**Each measurement is followed by its unit of greatest precision. Find the range of values that each measurement represents.**

- \_\_\_\_\_ 5. 22 ft (ft)  
 a.  $22 \pm 0.5$  ft      b.  $11 \pm 0.5$  ft      c.  $22 \pm 11$  ft      d.  $11 \pm 11$  ft
- \_\_\_\_\_ 6. 5 yd<sup>2</sup> (yd<sup>2</sup>)  
 a.  $5 \pm 2.5$  yd<sup>2</sup>      b.  $5 \pm 2.5$  yd<sup>2</sup>      c.  $2.5 \pm 0.5$  yd<sup>2</sup>      d.  $5 \pm 0.5$  yd<sup>2</sup>
- \_\_\_\_\_ 7. Find the percent error in calculating the perimeter of the figure.



Drawing not to scale

- a. 18%      b. 6%      c. 12%      d. 3%

**Find the mean, median, and mode of the data.**

- \_\_\_\_\_ 8. population of towns in Springfield County:  
1325, 885, 1248, 1387, 1138, 1000, 1587, 914, 2068, 1764
- a. mean = 1198.4, median = 1286.5, mode = 1476.5  
b. mean = 1198.4, median = 1286.5, mode = 1387  
c. mean = 1332, median = 1286.5, no mode  
d. mean = 1332, median = 1476.5, mode = 1387

**Simplify.**

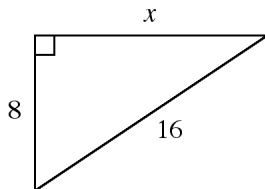
- \_\_\_\_\_ 9.  $10^2$   
a. -20                      b. 100                      c. -100                      d. 20
- \_\_\_\_\_ 10.  $(-18)^2$   
a. -324                      b. 324                      c. -36                      d. 36
- \_\_\_\_\_ 11.  $-4x - 6x - 1 - 5$   
a.  $2x + 4$                       b.  $-10x + 4$                       c.  $-10x - 6$                       d.  $2x - 6$
- \_\_\_\_\_ 12.  $(2x + 2)(4x + 3)$   
a.  $8x^2 + 14x + 6$                       c.  $8x^2 - 14x + 6$   
b.  $8x^2 - 2x - 6$                       d.  $8x^2 + 2x - 6$
- \_\_\_\_\_ 13.  $|6| - |-11|$   
a. -5                      b. 17                      c. 5                      d. -17
- \_\_\_\_\_ 14.  $-3|9 + 3|$   
a. -36                      b. 12                      c. 36                      d. -12

**Evaluate the expression for  $x = 2$  and  $y = -4$ .**

- \_\_\_\_\_ 15.  $-3x + 2y$   
a. -4                      b. -6                      c. -14                      d. 14

**Find the value of  $x$ . Leave your answer in simplest radical form.**

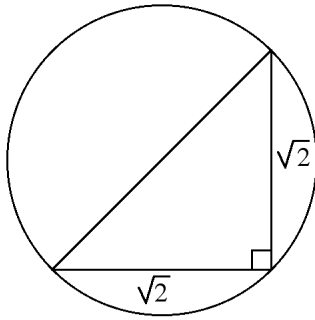
- \_\_\_\_\_ 16.



- a. 8                      b.  $16\sqrt{3}$                       c.  $4\sqrt{3}$                       d.  $8\sqrt{3}$

Express each ratio in simplest form.

- \_\_\_\_\_ 17. 12 to 3  
 a. 1 to 4                      b. 4 to 1                      c. 2 to 3                      d. 3 to 2
- \_\_\_\_\_ 18. Write an expression in simplest form for  $\frac{\text{area of circle}}{\text{area of triangle}}$ .



Drawing not to scale

- a.  $\pi$                       b.  $\frac{\pi}{3}$                       c.  $\frac{\pi}{4}$                       d.  $3\pi$

Solve the equation.

- \_\_\_\_\_ 19.  $56 - 13 + 5g = 78$   
 a. 7                      b. 4                      c. 9                      d. -7

Solve the equation for the variable given.

- \_\_\_\_\_ 20. Volume of a cylinder:  $V = \pi r^2 h$ ;  $r$   
 a.  $r = \left(\frac{\pi r}{V}\right)^2$                       b.  $r = \sqrt{V - \pi h}$                       c.  $r = \left(\frac{V}{\pi h}\right)^2$                       d.  $r = \sqrt{\frac{V}{\pi h}}$

Write the percent as a decimal.

- \_\_\_\_\_ 21. 24%  
 a. 0.0024                      b. 0.24                      c. 240                      d. 2.4

The letters S, E, L, E, C, T, E, D are written on pieces of paper and placed in a hat. You draw one letter at random. Find the probability of each outcome.

- \_\_\_\_\_ 22.  $P(E)$   
 a.  $\frac{5}{8}$                       b.  $\frac{3}{8}$                       c.  $\frac{1}{4}$                       d.  $\frac{5}{7}$

**Short Answer**

23. Draw a bar graph for the data in the table below.

<b>High School Graduation Rates</b>	
<b>State</b>	<b>Percent Graduating</b>
Alabama	80.4%
Delaware	81.6%
Iowa	89.2%
Nevada	73.5%
Pennsylvania	84.0%
Wisconsin	90.9%

24. Draw a line graph for the data in the table below.

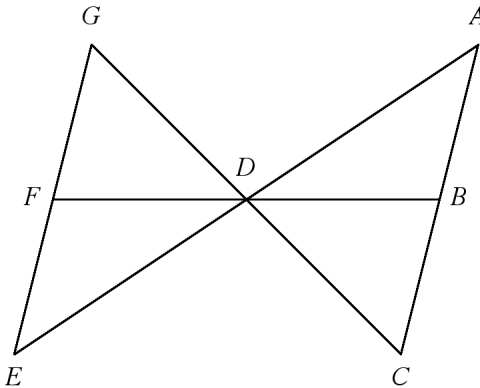
<b>Percent of Homes in the United States With Personal Computers</b>	
<b>Year</b>	<b>Percent</b>
1990	22%
1992	27%
1994	33%
1996	40%
1998	40%
2000	51%

25. Write a flow proof. Make the flow of logic as clear as you can.

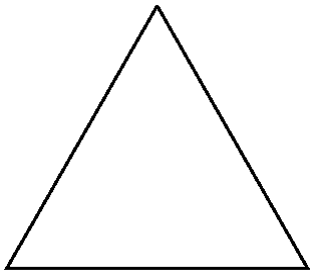
**Given:**  $\overline{EG} \cong \overline{CA}$

$\angle G \cong \angle C$

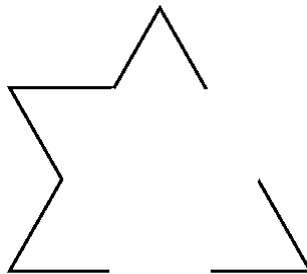
**Prove:**  $\triangle EFD \cong \triangle ABD$



26. The equilateral triangle below is Stage 0 of a Koch Snowflake with sides 1 unit long. Draw Stages 1 and 2. For Stage 1, replace the middle third of each segment with two segments, both  $\frac{1}{3}$  unit long. For Stage 2, replace the middle third of each segment with two segments, both  $\frac{1}{9}$  unit long. Stage 1 has been started for you.



Stage 0



Stage 1

27. Draw a triangular prism using one-point perspective. Show a base at the front.
28. Simplify  $-|19|$ .
29. Use the information from this table to answer the questions.

**RAIT Corporation Sales**

Year	Sales (\$millions)
1990	45
1991	5
1992	15
1993	30
1994	50

- a. Which would be the best way to display the data: a bar graph, a histogram, or a line graph? Justify your answer.
- b. Graph the data.
30. Draw a bar graph to display the number of participants in the school clubs listed in the table below.

Drama	Speech	Debate	Camera	Choir
90	50	35	25	20

## Geometry Diagnostic Test Answer Section

### MULTIPLE CHOICE

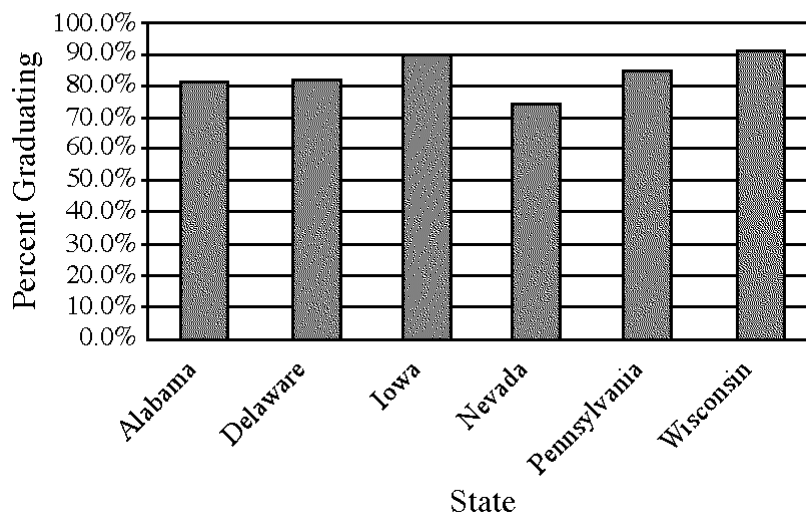
1. ANS: B                    DIF: L2                    REF: 0-28 Tangent Lines and Tangent Ratios  
OBJ: Tangent            TOP: Extension 11-4: Tangent Lines and Tangent Ratios  
KEY: tangent,cotangent,sine,cosine,trigonometric identities
2. ANS: D                    DIF: L2                    REF: 0-28 Tangent Lines and Tangent Ratios  
OBJ: Tangent            TOP: Extension 11-4: Tangent Lines and Tangent Ratios  
KEY: tangent,cotangent,sine,cosine,secant,cosecant,trigonometric identities
3. ANS: D                    DIF: L1                    REF: 0-8 Measurement Conversions  
OBJ: Measurement Conversions            TOP: Skills Handbook: Measurement Conversions  
KEY: measurement,conversion,length,customary units
4. ANS: D                    DIF: L1                    REF: 0-8 Measurement Conversions  
OBJ: Measurement Conversions            TOP: Skills Handbook: Measurement Conversions  
KEY: metric units,area,conversion,measurement
5. ANS: A                    DIF: L1  
REF: 0-9 Measurement, Rounding Error, and Reasonableness    OBJ: Measurement and Error  
TOP: Skills Handbook: Measurement, Rounding Error, and Reasonableness  
KEY: measurement,customary units,error
6. ANS: D                    DIF: L1  
REF: 0-9 Measurement, Rounding Error, and Reasonableness    OBJ: Measurement and Error  
TOP: Skills Handbook: Measurement, Rounding Error, and Reasonableness  
KEY: measurement,customary units,error
7. ANS: B                    DIF: L1  
REF: 0-9 Measurement, Rounding Error, and Reasonableness    OBJ: Measurement and Error  
TOP: Skills Handbook: Measurement, Rounding Error, and Reasonableness  
KEY: measurement,customary units,percent error
8. ANS: C                    DIF: L1                    REF: 0-11 Mean, Median, and Mode  
OBJ: Mean, Median, and Mode            TOP: Skills Handbook: Mean, Median, and Mode  
KEY: mean,median,mode,measures of central tendency
9. ANS: B                    DIF: L1  
REF: 0-14 Squaring Numbers and Finding Square Roots  
OBJ: Squares and Square Roots  
TOP: Skills Handbook: Squaring Numbers and Finding Square Roots  
KEY: squaring numbers,positive numbers
10. ANS: B                    DIF: L1  
REF: 0-14 Squaring Numbers and Finding Square Roots  
OBJ: Squares and Square Roots  
TOP: Skills Handbook: Squaring Numbers and Finding Square Roots  
KEY: squaring numbers,negative numbers
11. ANS: C                    DIF: L1                    REF: 0-15 Evaluating and Simplifying Expressions  
OBJ: Expressions    TOP: Skills Handbook: Evaluating and Simplifying Expressions  
KEY: monomial,polynomial,expression,simplify

12. ANS: A                    DIF: L1                    REF: 0-15 Evaluating and Simplifying Expressions  
OBJ: Expressions    TOP: Skills Handbook: Evaluating and Simplifying Expressions  
KEY: polynomial,expression,simplify
13. ANS: A                    DIF: L1                    REF: 0-18 Absolute Value  
OBJ: Absolute Value                    TOP: Skills Handbook: Absolute Value  
KEY: absolute value
14. ANS: A                    DIF: L1                    REF: 0-18 Absolute Value  
OBJ: Absolute Value                    TOP: Skills Handbook: Absolute Value  
KEY: absolute value
15. ANS: C                    DIF: L1                    REF: 0-15 Evaluating and Simplifying Expressions  
OBJ: Expressions    TOP: Skills Handbook: Evaluating and Simplifying Expressions  
KEY: evaluating expressions
16. ANS: D                    DIF: L1                    REF: 0-16 Simplifying Radicals  
OBJ: Radicals                    TOP: Skills Handbook: Simplifying Radicals  
KEY: Pythagorean Theorem,leg,hypotenuse,radical expressions,simplify
17. ANS: B                    DIF: L1                    REF: 0-17 Simplifying Ratios  
OBJ: Ratios                    TOP: Skills Handbook: Simplifying Ratios  
KEY: ratios,simplify
18. ANS: A                    DIF: L1                    REF: 0-17 Simplifying Ratios  
OBJ: Ratios                    TOP: Skills Handbook: Simplifying Ratios  
KEY: ratios,simplify
19. ANS: A                    DIF: L1                    REF: 0-19 Solving and Writing Linear Equations  
OBJ: Linear Equations  
TOP: Skills Handbook: Solving and Writing Linear Equations    KEY: solving linear equations
20. ANS: D                    DIF: L1                    REF: 0-20 Solving Literal Equations  
OBJ: Literal Equations                    TOP: Skills Handbook: Solving Literal Equations  
KEY: solving literal equations
21. ANS: B                    DIF: L1                    REF: 0-22 Percents  
OBJ: Percents                    TOP: Skills Handbook: Percents                    KEY: percents,decimals
22. ANS: B                    DIF: L1                    REF: 0-23 Probability  
OBJ: Probability                    TOP: Skills Handbook: Probability                    KEY: probability

## SHORT ANSWER

23. ANS:

Graphs may vary. Sample:

**High School Graduation Rates**

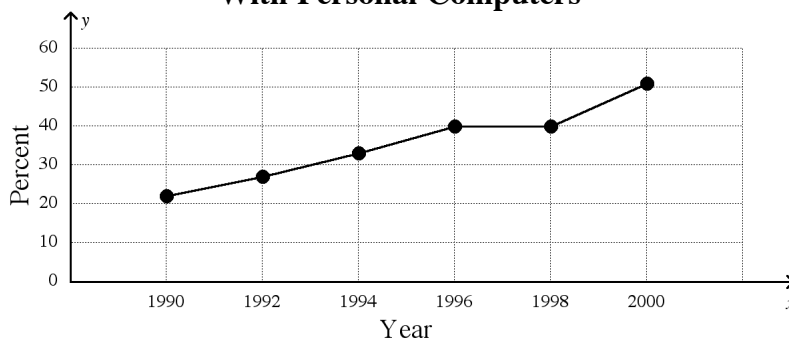
DIF: L1 REF: 0-12 Bar Graphs and Line Graphs

OBJ: Bar Graphs and Line Graphs TOP: Skills Handbook: Bar Graphs and Line Graphs

KEY: data analysis, bar graphs

24. ANS:

Graphs may vary. Sample:

**Percent of Homes in the United States  
With Personal Computers**

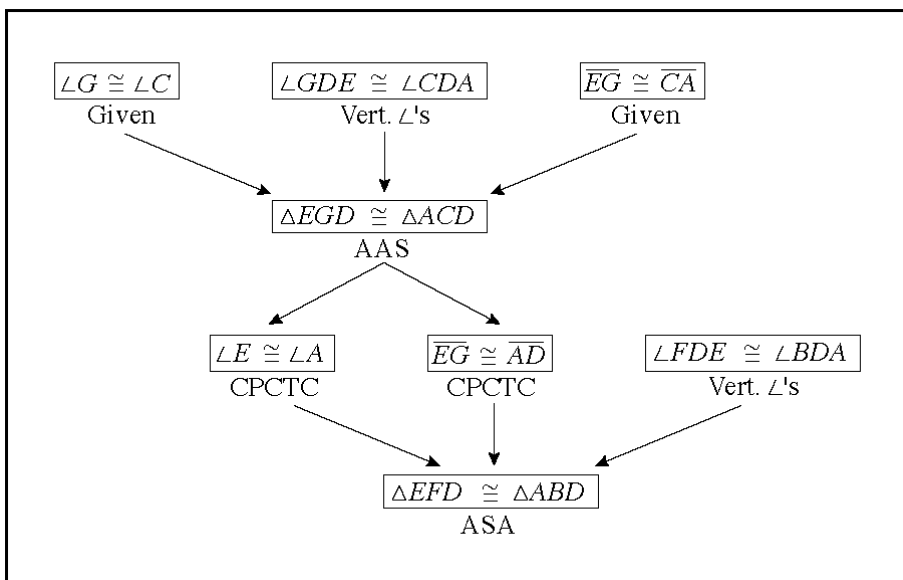
DIF: L1 REF: 0-12 Bar Graphs and Line Graphs

OBJ: Bar Graphs and Line Graphs TOP: Skills Handbook: Bar Graphs and Line Graphs

KEY: data analysis, line graphs



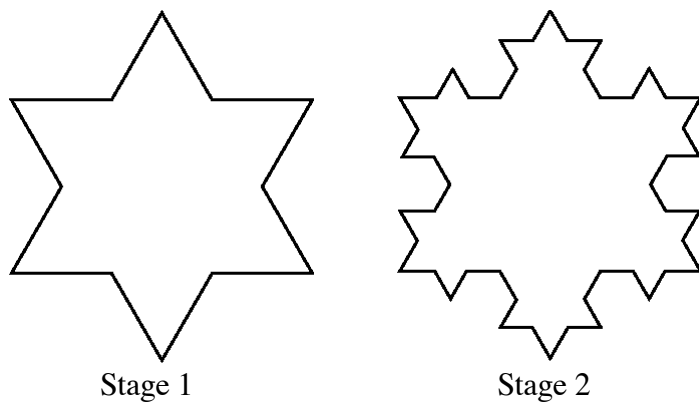
25. ANS:



DIF: L2 REF: 0-25 Writing Flow Proofs  
 TOP: Extension 4-7: Writing Flow Proofs

OBJ: Flow Proofs  
 KEY: flow proof, triangle

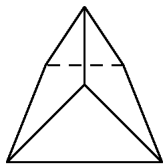
26. ANS:



DIF: L2 REF: 0-26 Fractals  
 TOP: Extension 8-2: Fractals

OBJ: Fractals  
 KEY: fractals, triangle, Koch Snowflake

27. ANS:  
 Drawings may vary. Sample:

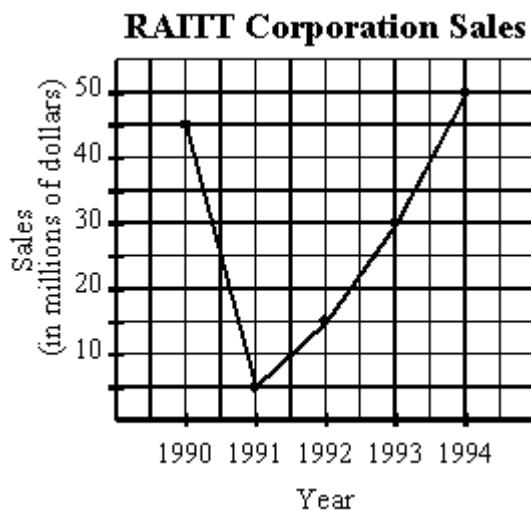


DIF: L2                      REF: 0-27 Perspective Drawing                      OBJ: Perspective Drawing  
 TOP: Extension 10-1: Perspective Drawing  
 KEY: one-point perspective, triangular prism

28. ANS:  
 -19

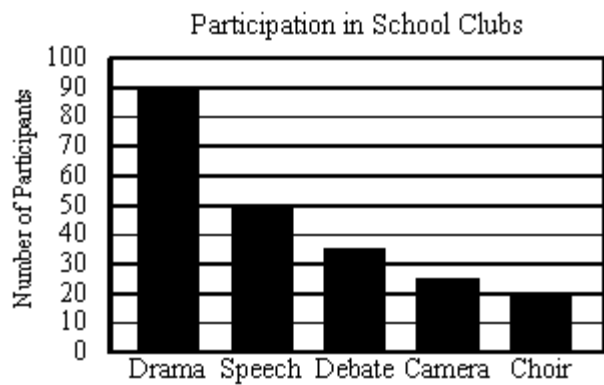
DIF: L1                      REF: 0-18 Absolute Value                      OBJ: Absolute Value  
 TOP: Skills Handbook: Absolute Value                      KEY: absolute value

29. ANS:  
 a. A line graph; explanations may vary. Sample: A line graph is the best way to display the data because it shows the change in sales over time.  
 b. Graphs may vary. Sample:



DIF: L1                      REF: 0-12 Bar Graphs and Line Graphs  
 OBJ: Bar Graphs and Line Graphs                      TOP: Skills Handbook: Bar Graphs and Line Graphs  
 KEY: line graphs, reasoning

30. ANS:



DIF: L1

REF: 0-12 Bar Graphs and Line Graphs

OBJ: Bar Graphs and Line Graphs

TOP: Skills Handbook: Bar Graphs and Line Graphs

KEY: bar graphs