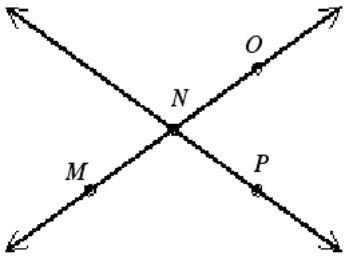
Sample Test to Determine Placement in Geometry or Algebra II

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

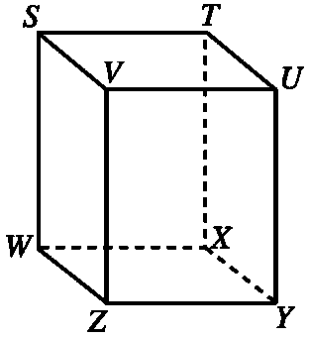
____ 1. Are O, N, and P collinear? If so, name the line on which they lie.



a. No, the three points are not collinear.
b. Yes, they lie on the line MP.
c. Yes, they lie on the line NP.
d. Yes, they lie on the line MO.

____ 2. Name the intersection of plane BPQ and plane CPQ.
a. $\overline{PQ}$
b. $\overline{BP}$
c. $\overline{CQ}$
d. The planes need not intersect.

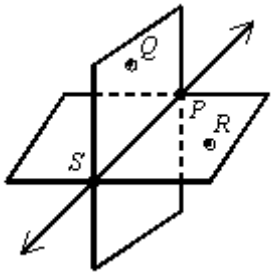
____ 3. Name a fourth point in plane TUW.



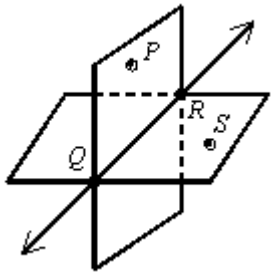
a. Y b. Z c. W d. X

____ 4. Which diagram shows plane *PQR* and plane *QRS* intersecting only in $\overleftrightarrow{QR}$?

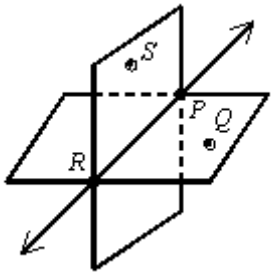
a.



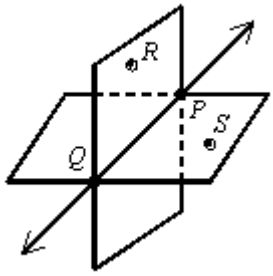
c.



b.



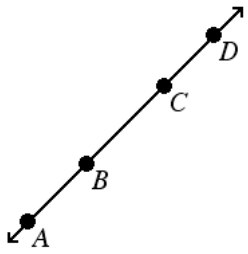
d.



____ 5. Name the ray in the figure.

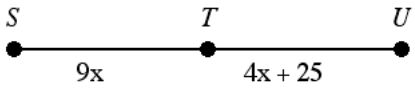
a. $\overrightarrow{BA}$ b. $\overleftrightarrow{AB}$ c. $\overline{BA}$ d. $\overrightarrow{AB}$

____ 6. Name the ray that is opposite $\overrightarrow{BA}$.



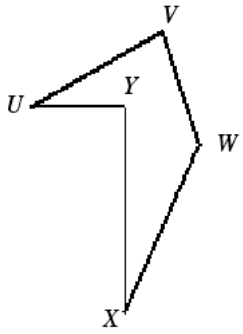
a. $\overrightarrow{BD}$ b. $\overrightarrow{BA}$ c. $\overrightarrow{CA}$ d. $\overrightarrow{DA}$

____ 7. If *T* is the midpoint of $\overline{SU}$, find the values of *x* and *ST*. The diagram is not to scale.



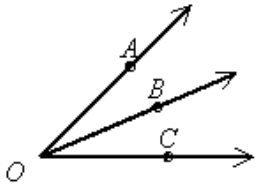
a. $x = 5, ST = 45$
b. $x = 5, ST = 60$
c. $x = 10, ST = 60$
d. $x = 10, ST = 45$

____ 8. Judging by appearance, name an acute angle, an obtuse angle, and a right angle.



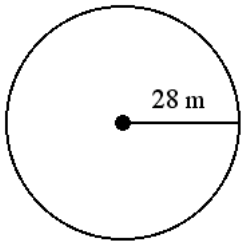
a. $\angle W, \angle X, \angle V$
b. $\angle V, \angle Y, \angle W$
c. $\angle U, \angle W, \angle Y$
d. $\angle U, \angle V, \angle Y$

____ 9. If $m\angle BOC = 27$ and $m\angle AOC = 47$, then what is the measure of $\angle AOB$? The diagram is not to scale.



a. 74 b. 40 c. 20 d. 54

____ 10. Find the circumference of the circle to the nearest tenth.Use 3.14 for π.



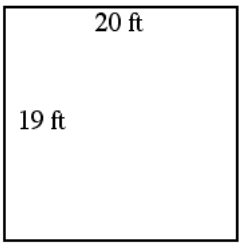
a. 2461.8 m b. 175.8 m c. 87.9 m d. 351.7 m

____ 11. Ken is adding a ribbon border to the edge of his kite. Two sides of the kite measure 9.5 inches, while the other two sides measure 17.8 inches. How much ribbon does Ken need?

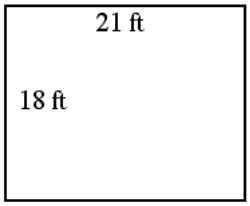
a. 45.1 in. b. 27.3 in. c. 54.6 in. d. 36.8 in.

____ 12. Jennifer has 78 feet of fencing to make a rectangular vegetable garden. Which dimensions will give Jennifer the garden with greatest area? The diagrams are not to scale.

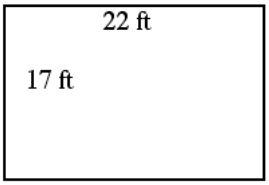
a.



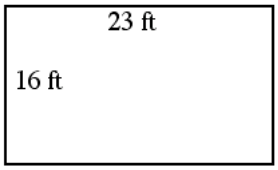
c.



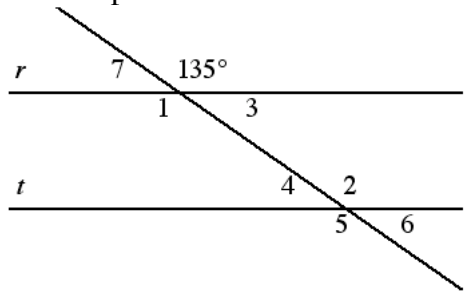
b.



d.

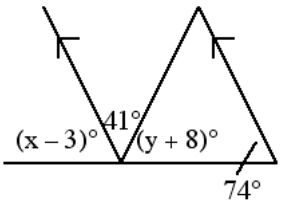


____ 13. Line r is parallel to line t. Find $m\angle 5$. The diagram is not to scale.



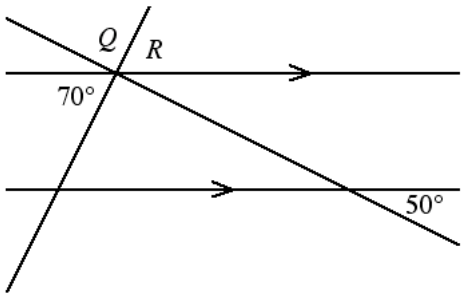
a. 45 b. 35 c. 135 d. 145

____ 14. Find the values of x and y. The diagram is not to scale.



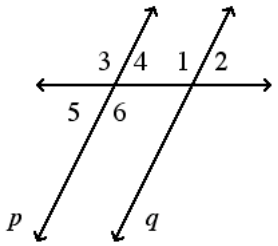
a. $x = 77, y = 59$
b. $x = 77, y = 57$
c. $x = 57, y = 77$
d. $x = 41, y = 57$

____ 15. Find $m\angle Q$. The diagram is not to scale.



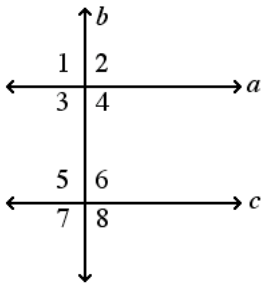
a. 60 b. 120 c. 110 d. 70

____ 16. $m\angle 1 = 6x$ and $m\angle 3 = 120$. Find the value of x for p to be parallel to q. The diagram is not to scale.



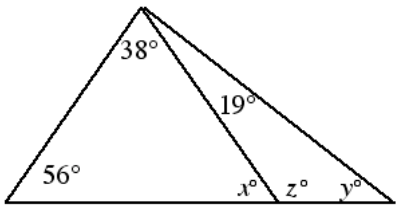
a. 114 b. 126 c. 120 d. 20

____ 17. If $c \perp b$ and $a \parallel c$, what is $m\angle 2$?



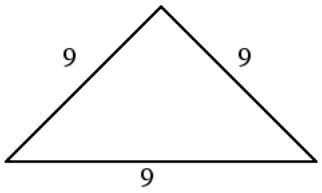
a. 90 c. 74
b. 106 d. not enough information

____ 18. Find the values of x, y, and z. The diagram is not to scale.



a. $x = 86,\ y = 94,\ z = 67$ c. $x = 67,\ y = 94,\ z = 86$
b. $x = 67,\ y = 86,\ z = 94$ d. $x = 86,\ y = 67,\ z = 94$

____ 19. Classify the triangle by its sides. The diagram is not to scale.



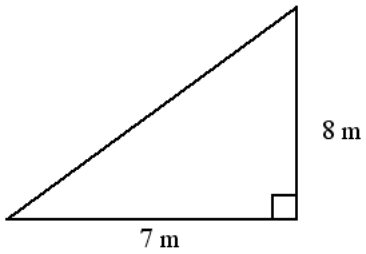
a. straight b. scalene c. isosceles d. equilateral

____ 20. Classify ΔABC by its angles, when $m\angle A = 32$, $m\angle B = 85$, and $m\angle C = 63$.

a. right b. straight c. obtuse d. acute

Find the length of the missing side. Leave your answer in simplest radical form.

____ 21.



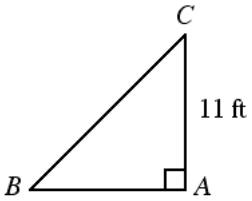
Not drawn to scale

a. $\sqrt{17}$ m b. 113 m c. $\sqrt{113}$ m d. $\sqrt{71}$ m

____ 22. A grid shows the positions of a subway stop and your house. The subway stop is located at (–5, 2) and your house is located at (–9, 9). What is the distance, to the nearest unit, between your house and the subway stop?

a. 5 b. 13 c. 8 d. 18

____ 23. In triangle ABC, $\angle A$ is a right angle and $m\angle B = 45°$. Find BC. If you answer is not an integer, leave it in simplest radical form.



Not drawn to scale

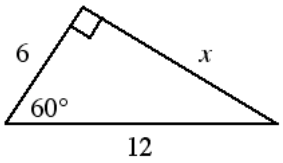
a. 22 ft b. $22\sqrt{2}$ ft c. 11 ft d. $11\sqrt{2}$ ft

____ 24. Find the length, d, in simplest radical form, of the diagonal of a cube with sides of s units.

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

Find the value of the variable(s). If your answer is not an integer, leave it in simplest radical form.

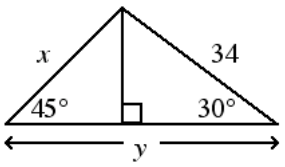
____ 25.



Not drawn to scale

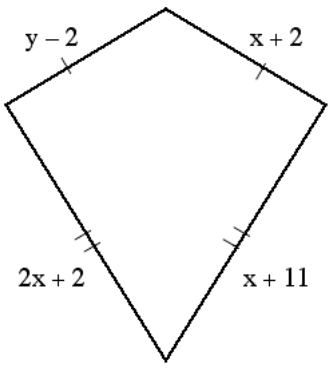
a. 2 b. $12\sqrt{3}$ c. $\frac{1}{2}$ d. $6\sqrt{3}$

____ 26. Find the value of x and y rounded to the nearest tenth.



a. $x = 48.1, y = 46.4$ c. $x = 24.0, y = 139.3$
b. $x = 48.1, y = 139.3$ d. $x = 24.0, y = 46.4$

____ 27. Find the values of the variables and the lengths of the sides of this kite.



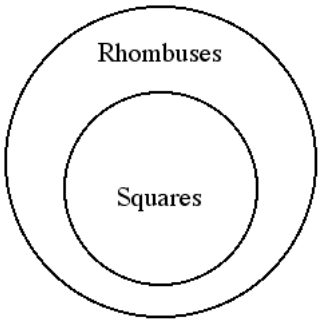
a. $x = 9, y = 13$; 7, 15 c. $x = 9, y = 13$; 11, 20
b. $x = 13, y = 9$; 7, 15 d. $x = 13, y = 9$; 11, 11

____ 28. What is the most precise name for quadrilateral $ABCD$ with vertices $A(-5, 2)$, $B(-3, 6)$, $C(6, 6)$, and $D(4, 2)$?

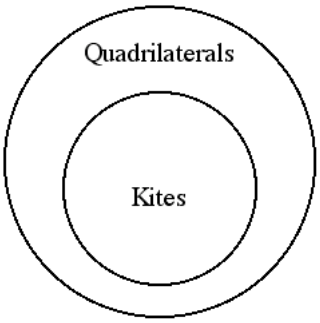
a. quadrilateral b. rectangle c. parallelogram d. rhombus

____ 29. Which Venn diagram is NOT correct?

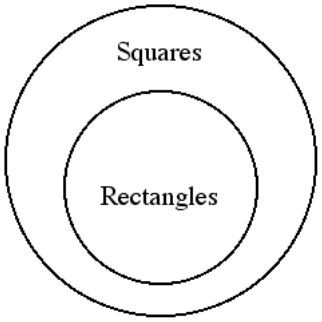
a.



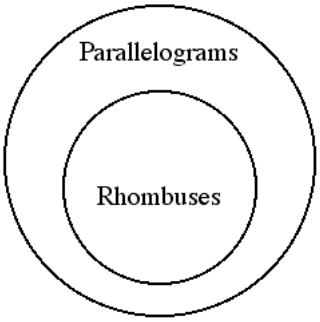
c.



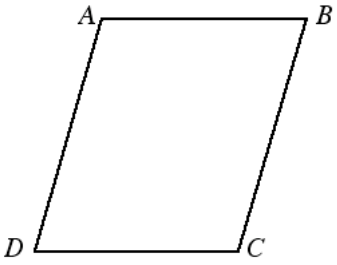
b.



d.

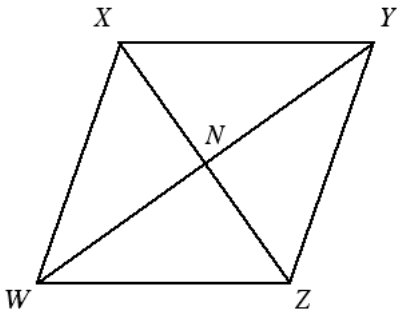


____ 30. *ABCD* is a parallelogram. If $m\angle CDA = 66$, then $m\angle BCD =$ ___?___. The diagram is not to scale.



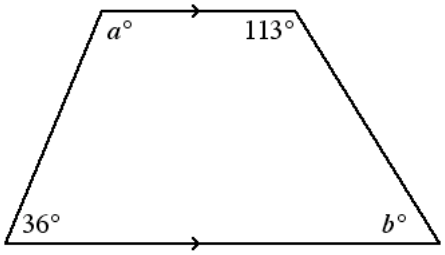
a. 66 b. 124 c. 114 d. 132

____ 31. *WXYZ* is a parallelogram. Name an angle congruent to $\angle WZY$.



a. $\angle ZXY$ b. $\angle XWZ$ c. $\angle ZXW$ d. $\angle WXY$

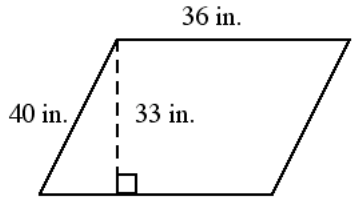
____ 32. Find the values of a and b.The diagram is not to scale.



a. $a = 144,\ b = 67$
b. $a = 144,\ b = 36$
c. $a = 113,\ b = 67$
d. $a = 113,\ b = 36$

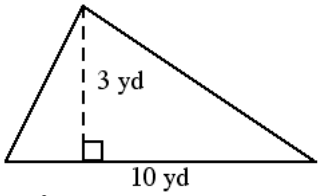
Find the area. The figure is not drawn to scale.

____ 33.



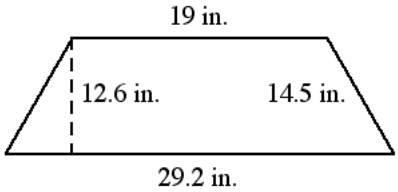
a. 1188 in.^{2}
b. 69 in.^{2}
c. 138 in.^{2}
d. 1440 in.^{2}

____ 34.



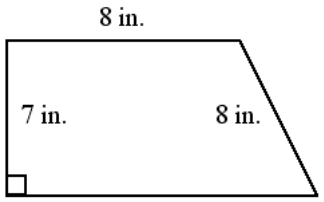
a. 30 yd^2
b. 6.5 yd^2
c. 13 yd^2
d. 15 yd^2

____ 35.



a. 607.32 in.^{2}
b. 36.7 in.^{2}
c. 303.66 in.^{2}
d. 77.2 in.^{2}

____ 36.



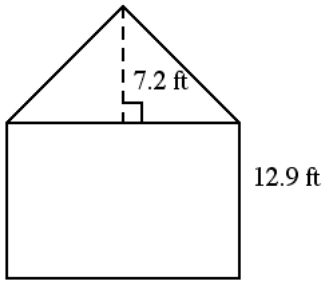
Not drawn to scale

a. 77.2 in.^{2} b. 80 in.^{2} c. 75 in.^{2} d. 70 in.^{2}

____ 37. The area of a parallelogram is 420 cm^2 and the height is 35 cm. Find the corresponding base.

a. 385 cm b. 455 cm c. 14,700 cm^2 d. 12 cm

____ 38. When designing a building, you must be sure that the building can withstand hurricane-force winds, which have a velocity of 73 mi/h or more. The formula $F = 0.004Av^2$ gives the force F in pounds exerted by a wind blowing against a flat surface. A is the area of the surface in square feet, and v is the wind velocity in miles per hour. How much force is exerted by a wind blowing at 81 mi/h against the side of the building shown?

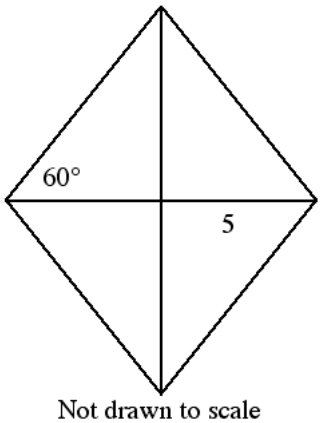


Not drawn to scale

a. about 54 tons c. about 10,826 tons

b. about 5 tons d. about 28 tons

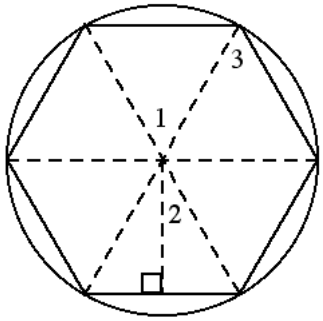
____ 39. Find the area of the rhombus. Leave your answer in simplest radical form.



Not drawn to scale

a. 50 b. $10\sqrt{3}$ c. $25\sqrt{6}$ d. $50\sqrt{3}$

____ 40. Given the regular hexagon, find the measure of each numbered angle.



a. $m\angle 1 = 30, m\angle 2 = 60, m\angle 3 = 30$
b. $m\angle 1 = m\angle 2 = m\angle 3 = 60$
c. $m\angle 1 = 60, m\angle 2 = 30, m\angle 3 = 60$
d. $m\angle 1 = 60, m\angle 2 = 30, m\angle 3 = 30$

____ 41. Find the area of an equilateral triangle with side 12.

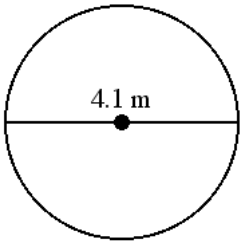
a. $36\sqrt{3}$ b. 72 c. 36 d. $3\sqrt{3}$

____ 42. A regular hexagon has a perimeter of 150 m. Find its area. Leave your answer in simplest radical form.

a. $5625\sqrt{3}$ m^2 b. $\frac{1875}{2}\sqrt{3}$ m^2 c. $\frac{25}{4}\sqrt{3}$ m^2 d. $\frac{5625}{2}\sqrt{3}$ m^2

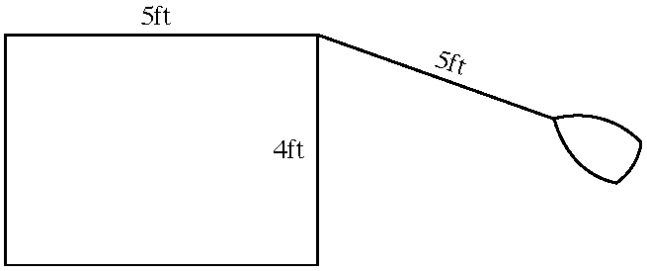
Find the area of the circle. Leave your answer in terms of π.

____ 43.



a. 4.2025π m^2 b. 8.405π m^2 c. 16.81π m^2 d. 11.2π m^2

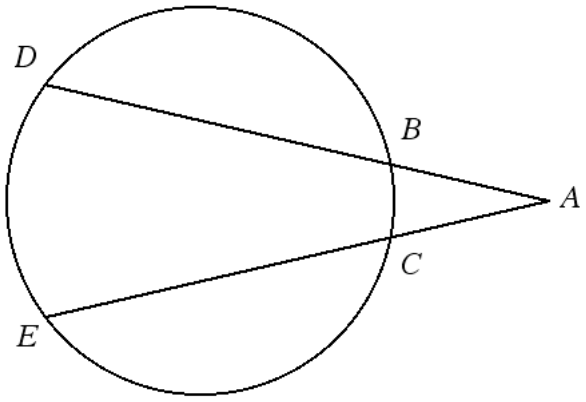
____ 44. A 4-ft-by-5-ft dock is anchored in the middle of a lake. The bow of a boat is tied to a corner of the dock with a 5-ft rope as shown in the picture. Find the area of the region in which the bow of the boat can travel. Round your answer to the nearest foot.



Not drawn to scale

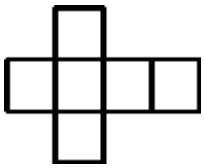
a. 60 ft^2 b. 58 ft^2 c. 81 ft^2 d. none of these

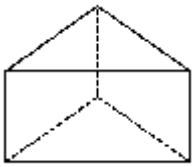
____ 45. m(arc DE) = 96 and m(arc BC) = 67. Find $m\angle A$. (The figure is not drawn to scale.)

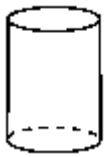


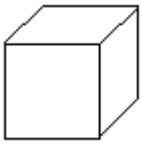
a. 14.5 b. 62.5 c. 81.5 d. 29

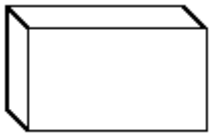
____ 46. Which three-dimensional figure matches this net?



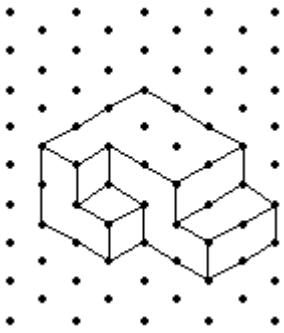
a. 

c. 

b. 

d. 

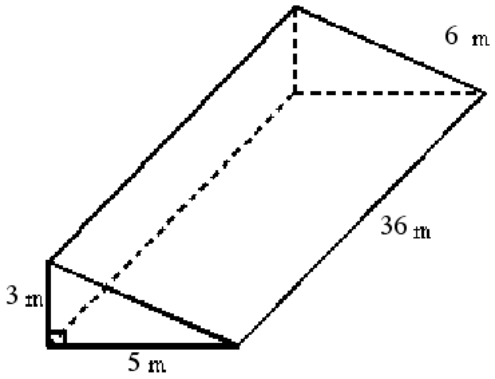
____ 47. How many cubes would you use to make the structure below?



a. 15 cubes b. 16 cubes c. 17 cubes d. 18 cubes

Use formulas to find the lateral area and surface area of the given prism. Show your answer to the nearest whole number.

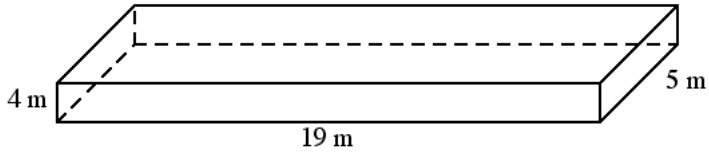
____ 48.



Not drawn to scale

a. 468 m^2; 519 m^2
c. 504 m^2; 512 m^2
b. 468 m^2; 534 m^2
d. 504 m^2; 519 m^2

____ 49.



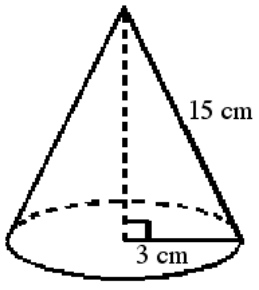
Not drawn to scale

a. 192 m^2; 287 m^2
c. 192 m^2; 382 m^2
b. 342 m^2; 287 m^2
d. 342 m^2; 382 m^2

____ 50. Allison is planning to cover the lateral surface of a large cylindrical garbage can with decorative fabric for a theme party. The can has a diameter of 3 feet and a height of 3.5 feet. How much fabric does she need? Round to the nearest square foot.

a. 123 ft^2
b. 61 ft^2
c. 33 ft^2
d. 66 ft^2

____ 51. Find the surface area of the cone in terms of π.

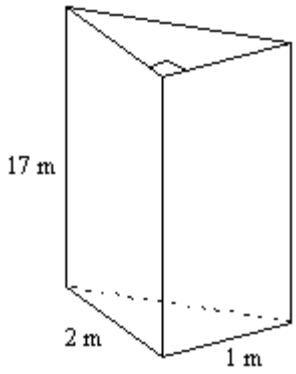


Not drawn to scale

a. 54π cm^2
b. 99π cm^2
c. 51π cm^2
d. 49.5 cm^2

Find the volume of the given prism. Round to the nearest tenth if necessary.

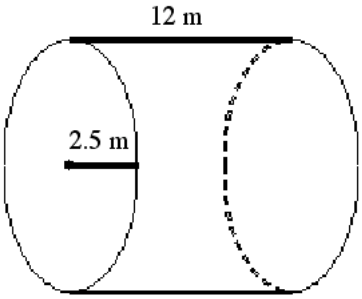
____ 52.



a. 17 m^3 b. 34 m^3 c. 8.5 m^3 d. 1 m^3

Find the volume of the cylinder in terms of π.

____ 53.



Not drawn to scale

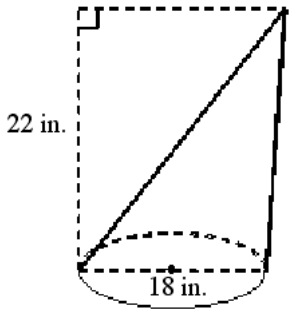
a. $75\pi \text{ m}^3$ b. 60 m^3 c. $37.5\pi \text{ m}^3$ d. $187.5\pi \text{ m}^3$

____ 54. Cylinder A has radius 1 m and height 4 m. Cylinder B has radius 2 m and height 4 m. Find the ratio of the volume of cylinder A to the volume of cylinder B.

a. 5 : 6 b. 1 : 4 c. 1 : 2 d. 1 : 1

Find the volume of the cone shown as a decimal rounded to the nearest tenth.

____ 55.

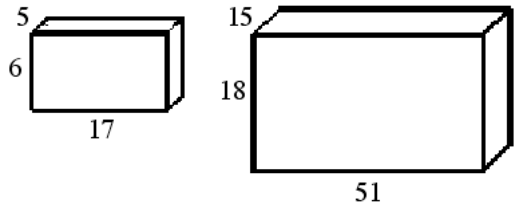


Not drawn to scale

a. 207.3 in.^{3} b. 1866.1 in.^{3} c. 5598.3 in.^{3} d. 2799.2 in.^{3}

Are the two figures similar? If so, give the similarity ratio of the smaller figure to the larger figure.

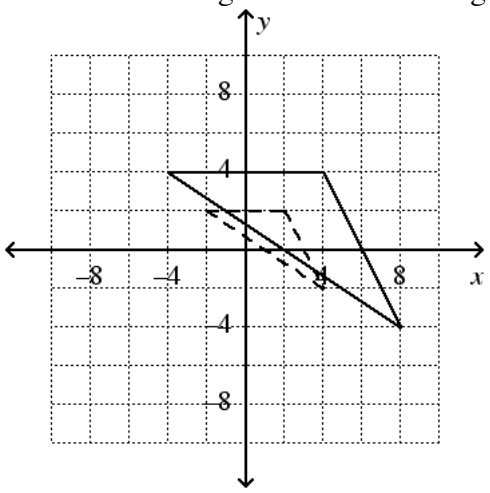
____ 56.



Not drawn to scale

a. yes; 1: 3 b. yes; 1: 2 c. yes; 1: 5 d. no

____ 57. The dashed triangle is a dilation image of the solid triangle. What is the scale factor?

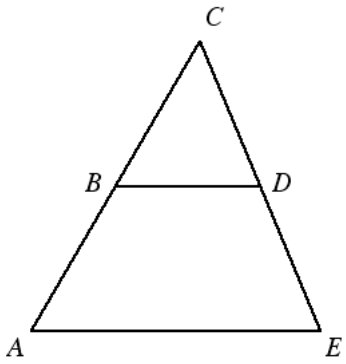


a. $\frac{1}{4}$ b. $\frac{1}{2}$ c. $\frac{2}{3}$ d. 2

____ 58. A blueprint for a house has a scale of 1 : 35. A wall in the blueprint is 3 in. What is the length of the actual wall?

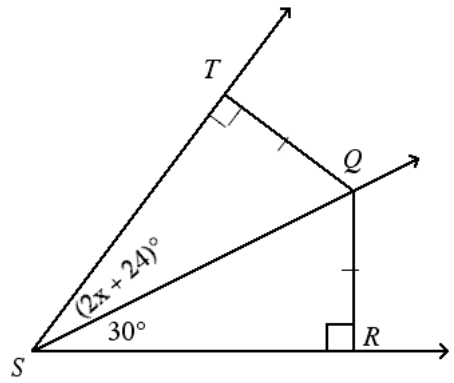
a. 105 feet b. 8.75 feet c. 8.75 in. d. 1,260 feet

____ 59. *B* is the midpoint of $\overline{AC}$, *D* is the midpoint of $\overline{CE}$, and *AE* = 21. Find *BD*. The diagram is not to scale.



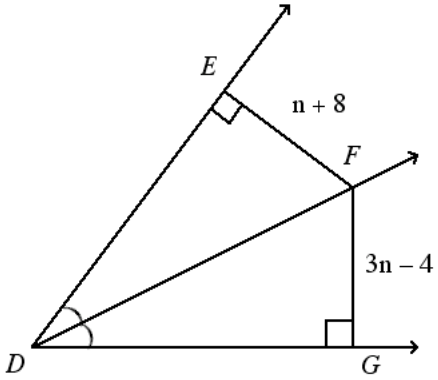
a. 42 b. 21 c. 11.5 d. 10.5

____ 60. Q is equidistant from the sides of $\angle TSR$. Find the value of x. The diagram is not to scale.



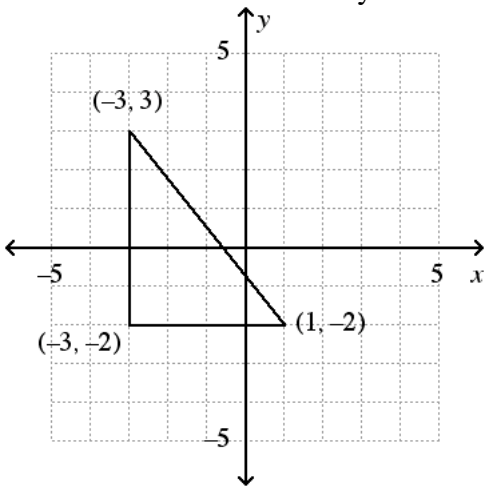
a. 27 b. 3 c. 15 d. 30

____ 61. $\overrightarrow{DF}$ bisects $\angle EDG$. Find FG. The diagram is not to scale.



a. 15 b. 14 c. 19 d. 28

____ 62. Find the center of the circle that you can circumscribe about the triangle.

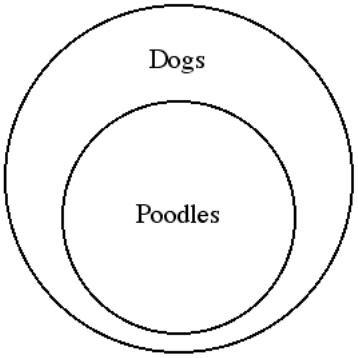


a. $(\frac{1}{2}, -1)$ b. $(-1, \frac{1}{2})$ c. $(-3, \frac{1}{2})$ d. $(-1, -2)$

____ 63. What is the inverse of this statement?
If he speaks Arabic, he can act as the interpreter.

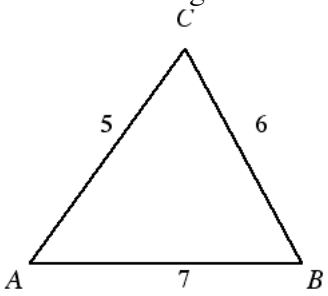
a. If he does not speak Arabic, he can act as the interpreter.
b. If he speaks Arabic, he can't act as the interpreter.
c. If he can act as the interpreter, then he does not speak Arabic.
d. If he does not speak Arabic, he can't act as the interpreter.

____ 64. Write the contrapositive of the conditional statement illustrated by this Venn diagram.



a. If an animal is not a poodle, then it is a dog.
b. If an animal is not a dog, then it is a poodle.
c. If an animal is not a poodle, then it is not a dog.
d. If an animal is not a dog, then it is not a poodle.

____ 65. Name the smallest angle of ΔABC. The diagram is not to scale.



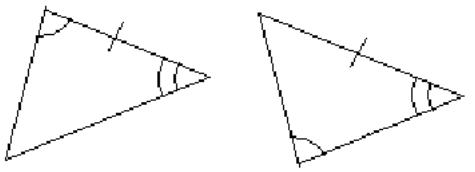
a. $\angle A$
b. $\angle C$
c. Two angles are the same size and smaller than the third.
d. $\angle B$

____ 66. Three security cameras were mounted at the corners of a triangular parking lot. Camera 1 was 158 ft from camera 2, which was 121 ft from Camera 3. Cameras 1 and 3 were 140 ft apart. Which camera had to cover the greatest angle?

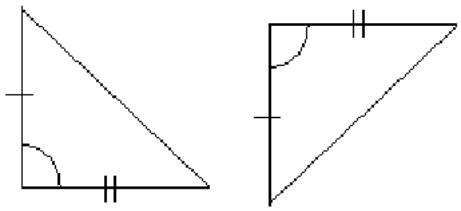
a. camera 2 b. camera 1 c. cannot tell d. camera 3

____ 67. In each pair of triangles, parts are congruent as marked. Which pair of triangles is congruent by ASA?

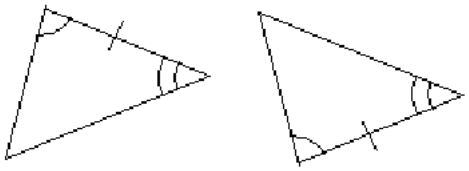
a.



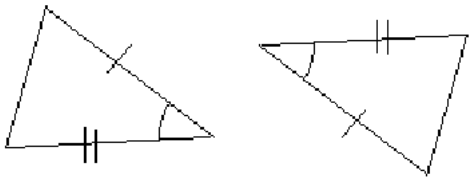
c.



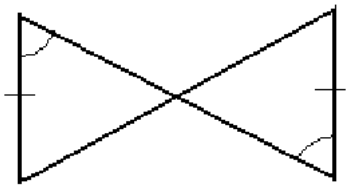
b.



d.

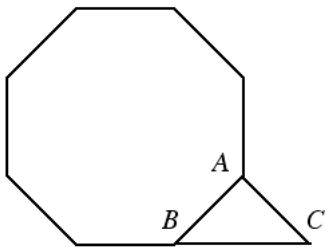


____ 68. Can you use the ASA Postulate, the AAS Theorem, or both to prove the triangles congruent?



a. either ASA or AAS
b. ASA only
c. AAS only
d. neither

____ 69. The octagon in the figure is equiangular and $\overline{AB} \cong \overline{AC}$. Find $m\angle ACB$.

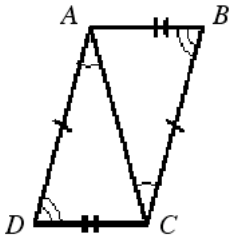


a. 135 b. 45 c. 30 d. 90

____ 70. Two sides of an equilateral triangle have lengths $2x - 2$ and $3x - 6$. Which of $10 - x$ or $6x + 5$ could be the length of the third side?

a. neither $10 - x$ nor $6x + 5$
b. $10 - x$ only
c. both $10 - x$ and $6x + 5$
d. $6x + 5$ only

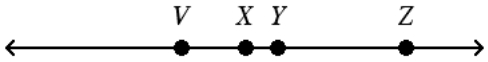
____ 71. Use the information given in the diagram. Tell why $\overline{AC} \cong \overline{AC}$ and $\angle BCA \cong \angle DAC$.



a. Reflexive Property, Given
b. Transitive Property, Reflexive Property
c. Given, Reflexive Property
d. Reflexive Property, Transitive Property

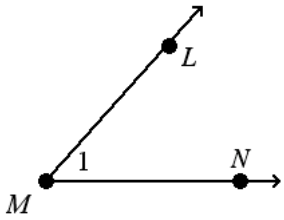
Short Answer

72. Name four rays shown.

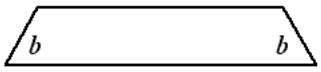


73. On a number line, P has coordinate –47 and Q has coordinate 40. Find PQ.

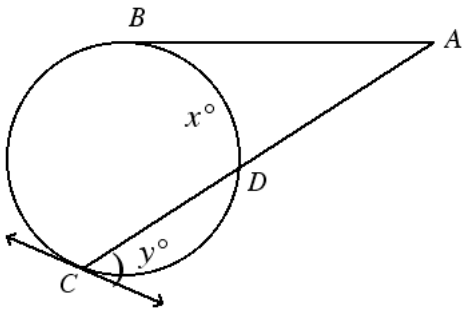
74. What are three names for the angle?



75. Suppose you have four identical pieces of wood like those shown below. If $m\angle b = 40°$ can you construct a frame with opposite sides parallel? Explain.

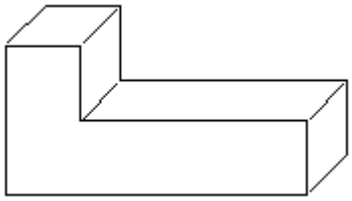


76. $m\angle A = 20$ and $m(\text{arc } BC) = 88$ (The figure is not drawn to scale.)

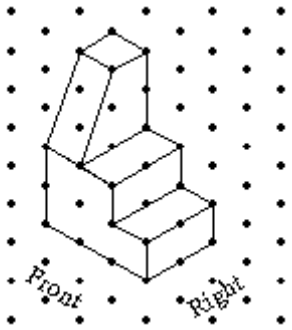


a. Find x.
b. Find y.

77. Vernon is making a container, as shown below, for shipping an odd-shaped item. Draw a net for the container.

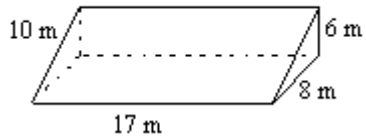


78. Make an orthographic drawing from the isometric drawing shown below.

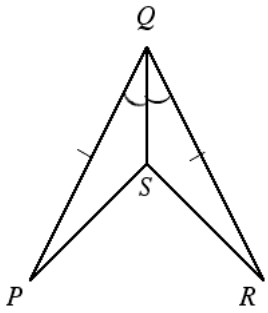


Consider the prism shown below.
a. Draw a net for the prism and label all dimensions.
b. Use the net to find the surface area of the prism.

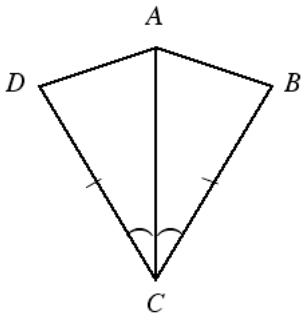
79.



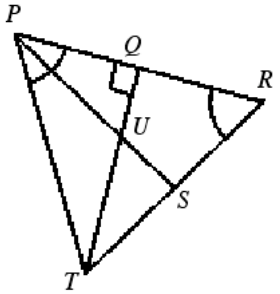
80. Is there enough information to prove the two triangles congruent? If yes, write the congruence statement and name the postulate you would use. If no, write *not possible* and tell what other information you would need.



81. Explain how you can use SSS, SAS, ASA, or AAS with CPCTC to prove that $\angle D \cong \angle B$.



82. Determine which triangles in the figure are congruent by AAS.

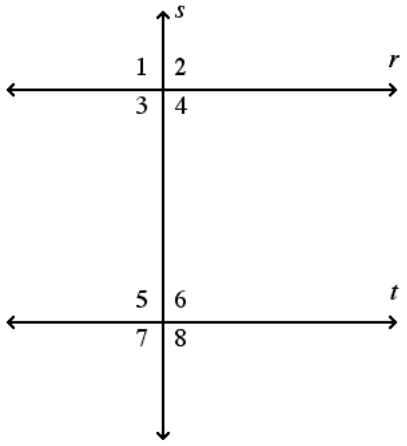


Essay

83. Write a paragraph proof of this theorem: In a plane, if two lines are perpendicular to the same line, then they are parallel to each other.

Given: $r \perp s, t \perp s$

Prove: $r \parallel t$



84. A 16-foot ladder is placed against the side of a building as shown in Figure 1 below. The bottom of the ladder is 8 feet from the base of the building. In order to increase the reach of the ladder against the building, the ladder is moved 4 feet closer to the base of the building as shown in Figure 2.

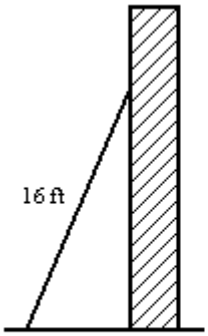


Figure 1

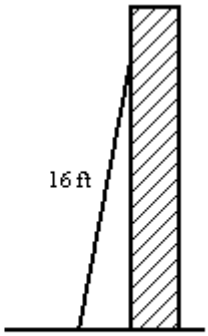


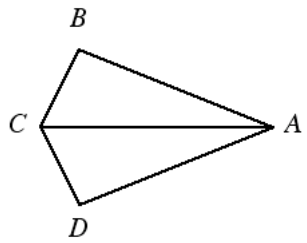
Figure 2

To the *nearest foot*, how much farther up the building does the ladder now reach? Show how you arrived at your answer.

85. A log cabin is shaped like a rectangular prism. A model of the cabin has a scale of 1 centimeter to 0.5 meters.
    - **a.** If the model is 14 cm by 20 cm by 7 cm, what are the dimensions of the actual log cabin? Explain how you find the dimensions.
    - **b.** What is the volume of the actual log cabin? Explain how you find the volume.
    - **c.** What is the ratio of the volume of the model of the cabin to the volume of the actual cabin? Explain your method for finding the ratio.

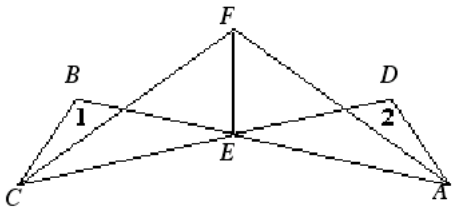
86. An hourglass, composed of two identical cones, is 12 cm tall. The radius of each cone is 3 cm. If you want to fill the bottom half of the hourglass $\frac{2}{3}$ full of salt, how much salt will you need? Explain the method you use to find the amount of salt.

87. Write a two-column proof:
Given: $\angle BAC \cong \angle DAC,\ \angle DCA \cong \angle BCA$
Prove: $\overline{BC} \cong \overline{CD}$



88. Write a proof.

Given: $\overline{BC} \cong \overline{DA},\ \angle 1 \cong \angle 2,$ and $\overline{CF} \cong \overline{AF}$
Prove: $\Delta CFE \cong \Delta AFE$

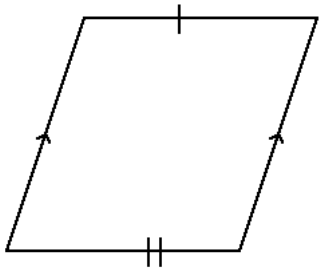


Other

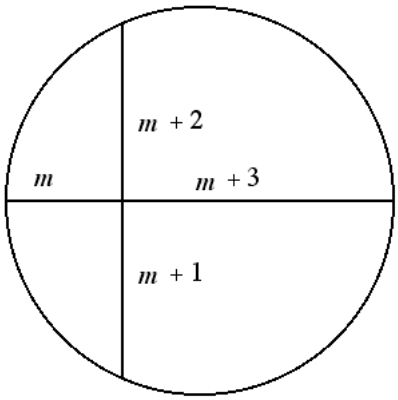
89. Justify the statement algebraically.

In a triangle, if the sum of the measures of two angles is equal to the measure of the third angle, then the triangle is a right triangle.

90. Can this quadrilateral be a parallelogram? Explain.



91. Show that it is not possible for the lengths of the segments of two intersecting chords to be four consecutive integers.



92. P, Q, and R are three different points. $PQ = 3x + 2$, $QR = x$, and $RP = x + 2$, and $x > 0$.. List the angles of ΔPQR in order from largest to smallest and justify your response.

Sample Test to Determine Placement in Geometry or Algebra II
Answer Section

MULTIPLE CHOICE

1. ANS: A DIF: L1 REF: 1-2 Points, Lines, and Planes
   OBJ: 1-2.1 Basic Terms of Geometry STO: KS 2.4.1, KS 3.1.1
   TOP: 1-2 Example 1 KEY: point,line,collinear points
   MSC: NAEP G1c, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14
2. ANS: A DIF: L2 REF: 1-2 Points, Lines, and Planes
   OBJ: 1-2.2 Basic Postulates of Geometry STO: KS 2.4.1, KS 3.1.1
   TOP: 1-2 Example 3 KEY: plane,intersection of two planes
   MSC: NAEP G1c, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14
3. ANS: B DIF: L2 REF: 1-2 Points, Lines, and Planes
   OBJ: 1-2.2 Basic Postulates of Geometry STO: KS 2.4.1, KS 3.1.1
   TOP: 1-2 Example 4 KEY: point,plane
   MSC: NAEP G1c, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14
4. ANS: C DIF: L1 REF: 1-2 Points, Lines, and Planes
   OBJ: 1-2.2 Basic Postulates of Geometry STO: KS 2.4.1, KS 3.1.1
   TOP: 1-2 Example 3 KEY: plane,intersection of two planes
   MSC: NAEP G1c, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14
5. ANS: A DIF: L1 REF: 1-3 Segments, Rays, Parallel Lines and Planes
   OBJ: 1-3.1 Identifying Segments and Rays STO: KS 3.1.1
   TOP: 1-3 Example 1 KEY: ray
   MSC: NAEP G3g, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14
6. ANS: A DIF: L1 REF: 1-3 Segments, Rays, Parallel Lines and Planes
   OBJ: 1-3.1 Identifying Segments and Rays STO: KS 3.1.1
   TOP: 1-3 Example 1 KEY: ray,opposite rays
   MSC: NAEP G3g, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14
7. ANS: A DIF: L1 REF: 1-4 Measuring Segments and Angles
   OBJ: 1-4.1 Finding Segment Lengths
   STO: KS 1.4.2, KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.4.1 TOP: 1-4 Example 3
   KEY: segment,segment length,midpoint,multi-part question
   MSC: NAEP M1e, NAEP M1f, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.13, TV.LV20.14
8. ANS: C DIF: L1 REF: 1-4 Measuring Segments and Angles
   OBJ: 1-4.2 Finding Angle Measures
   STO: KS 1.4.2, KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.4.1 TOP: 1-4 Example 5
   KEY: acute angle,right angle,obtuse angle
   MSC: NAEP M1e, NAEP M1f, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.13, TV.LV20.14
9. ANS: C DIF: L1 REF: 1-4 Measuring Segments and Angles
   OBJ: 1-4.2 Finding Angle Measures
   STO: KS 1.4.2, KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.4.1 TOP: 1-4 Example 6
   KEY: Angle Addition Postulate

MSC: NAEP M1e, NAEP M1f, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.13, TV.LV20.14

10. ANS: B DIF: L1 REF: 1-7 Perimeter¸ Circumference¸ and Area
OBJ: 1-7.1 Finding Perimeter and Circumference
STO: KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.2.3, KS 3.2.4 TOP: 1-7 Example 2
KEY: circle,circumference
MSC: NAEP M1c, NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

11. ANS: C DIF: L2 REF: 1-7 Perimeter¸ Circumference¸ and Area
OBJ: 1-7.1 Finding Perimeter and Circumference
STO: KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.2.3, KS 3.2.4 TOP: 1-7 Example 1
KEY: perimeter,problem solving,word problem
MSC: NAEP M1c, NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

12. ANS: A DIF: L2 REF: 1-7 Perimeter¸ Circumference¸ and Area
OBJ: 1-7.2 Finding Area
STO: KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.2.3, KS 3.2.4
KEY: rectangle,area,word problem,problem solving
MSC: NAEP M1c, NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

13. ANS: C DIF: L1 REF: 3-1 Properties of Parallel Lines
OBJ: 3-1.2 Properties of Parallel Lines STO: KS 1.4.2, KS 3.1.2, KS 3.4.1
TOP: 3-1 Example 4 KEY: parallel lines, alternate interior angles
MSC: NAEP M1f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

14. ANS: B DIF: L1 REF: 3-1 Properties of Parallel Lines
OBJ: 3-1.2 Properties of Parallel Lines STO: KS 1.4.2, KS 3.1.2, KS 3.4.1
TOP: 3-1 Example 5 KEY: corresponding angles,parallel lines
MSC: NAEP M1f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

15. ANS: A DIF: L2 REF: 3-1 Properties of Parallel Lines
OBJ: 3-1.2 Properties of Parallel Lines STO: KS 1.4.2, KS 3.1.2, KS 3.4.1
KEY: angle,parallel lines,transversal
MSC: NAEP M1f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

16. ANS: D DIF: L1 REF: 3-2 Proving Lines Parallel
OBJ: 3-2.2 Relating Parallel and Perpendicular Lines STO: KS 2.4.1, KS 2.4.2
TOP: 3-2 Example 4 KEY: parallel lines
MSC: NAEP M1e, NAEP M1f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13,

TV.LV20.14, TV.LV20.16

17. ANS: A DIF: L2 REF: 3-2 Proving Lines Parallel
OBJ: 3-2.2 Relating Parallel and Perpendicular Lines STO: KS 2.4.1, KS 2.4.2
KEY: parallel lines,perpendicular lines,transversal
MSC: NAEP M1e, NAEP M1f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

18. ANS: D DIF: L1
REF: 3-3 Parallel Lines and the Triangle Angle-Sum Theorem
OBJ: 3-3.1 Finding Angle Measures in Triangles STO: KS 1.4.2, KS 3.4.1
TOP: 3-3 Example 2 KEY: triangle,sum of angles of a triangle
MSC: NAEP G3b, NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

19. ANS: D DIF: L1
REF: 3-3 Parallel Lines and the Triangle Angle-Sum Theorem
OBJ: 3-3.1 Finding Angle Measures in Triangles STO: KS 1.4.2, KS 3.4.1
TOP: 3-3 Example 3
KEY: acute triangle,triangle,classifying triangles,scalene,isosceles triangle,equilateral
MSC: NAEP G3b, NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

20. ANS: D DIF: L1
REF: 3-3 Parallel Lines and the Triangle Angle-Sum Theorem
OBJ: 3-3.1 Finding Angle Measures in Triangles STO: KS 1.4.2, KS 3.4.1
TOP: 3-3 Example 3
KEY: triangle,classifying triangles,right triangle,obtuse triangle,acute triangle
MSC: NAEP G3b, NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

21. ANS: C DIF: L1 REF: 7-2 The Pythagorean Theorem and Its Converse
OBJ: 7-2.1 The Pythagorean Theorem
STO: KS 1.4.2, KS 2.2.3, KS 3.1.6, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.4.5
TOP: 7-2 Example 2 KEY: Pythagorean Theorem,leg,hypotenuse
MSC: NAEP G3d, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

22. ANS: C DIF: L2 REF: 7-2 The Pythagorean Theorem and Its Converse
OBJ: 7-2.1 The Pythagorean Theorem
STO: KS 1.4.2, KS 2.2.3, KS 3.1.6, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.4.5
TOP: 7-2 Example 3
KEY: Pythagorean Theorem,leg,hypotenuse,word problem,problem solving
MSC: NAEP G3d, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14,

TV.LV20.52

23. ANS: D DIF: L2 REF: 7-3 Special Right Triangles
OBJ: 7-3.1 45°-45°-90° Triangles STO: KS 3.1.5, KS 3.1.6, KS 3.2.3, KS 3.2.4
TOP: 7-3 Example 1 KEY: special right triangles
MSC: NAEP G3d, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

24. ANS: C DIF: L3 REF: 7-3 Special Right Triangles
OBJ: 7-3.1 45°-45°-90° Triangles STO: KS 3.1.5, KS 3.1.6, KS 3.2.3, KS 3.2.4
TOP: 7-3 Example 3 KEY: special right triangles,diagonal
MSC: NAEP G3d, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

25. ANS: D DIF: L1 REF: 7-3 Special Right Triangles
OBJ: 7-3.2 Using 30°-60°-90° Triangles STO: KS 3.1.5, KS 3.1.6, KS 3.2.3, KS 3.2.4
TOP: 7-3 Example 4 KEY: special right triangles,leg,hypotenuse
MSC: NAEP G3d, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

26. ANS: D DIF: L2 REF: 7-3 Special Right Triangles
OBJ: 7-3.2 Using 30°-60°-90° Triangles STO: KS 3.1.5, KS 3.1.6, KS 3.2.3, KS 3.2.4
TOP: 7-3 Example 5 KEY: special right triangles,leg,hypotenuse
MSC: NAEP G3d, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

27. ANS: C DIF: L1 REF: 6-1 Classifying Quadrilaterals
OBJ: 6-1.1 Classifying Special Quadrilaterals
STO: KS 1.4.2, KS 2.4.1, KS 2.4.2 TOP: 6-1 Example 3
KEY: algebra,kite
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

28. ANS: C DIF: L1 REF: 6-1 Classifying Quadrilaterals
OBJ: 6-1.1 Classifying Special Quadrilaterals
STO: KS 1.4.2, KS 2.4.1, KS 2.4.2 TOP: 6-1 Example 2
KEY: kite,parallelogram,quadrilateral,special quadrilaterals,rectangle,square,trapezoid
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16 NOT: TC 07, Bimodal, Dynamic (pick up)

29. ANS: B DIF: L1 REF: 6-1 Classifying Quadrilaterals
OBJ: 6-1.1 Classifying Special Quadrilaterals
STO: KS 1.4.2, KS 2.4.1, KS 2.4.2 KEY: reasoning,quadrilateral,Venn Diagram
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16 NOT: TC 12, MC, Static.

30. ANS: C DIF: L1 REF: 6-2 Properties of Parallelograms

OBJ: 6-2.1 Properties: Sides and Angles STO: KS 1.4.2, KS 3.1.2, KS 3.4.1
TOP: 6-2 Example 1 KEY: parallelogram,consectutive angles
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.12, TV.LV20.14, TV.LV20.16

31. ANS: D DIF: L1 REF: 6-2 Properties of Parallelograms
OBJ: 6-2.1 Properties: Sides and Angles STO: KS 1.4.2, KS 3.1.2, KS 3.4.1
KEY: parallelogram,opposite angles
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.12, TV.LV20.14, TV.LV20.16

32. ANS: A DIF: L1 REF: 6-5 Trapezoids and Kites
OBJ: 6-5.1 Properties of Trapezoids and Kites
STO: KS 2.2.3, KS 3.2.1, KS 3.2.2, KS 3.2.3, KS 3.2.4 TOP: 6-5 Example 1
KEY: trapezoid,base angles,Theorem 6-15
MSC: NAEP G3f, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.13, TV.LV20.14

33. ANS: A DIF: L1 REF: 7-1 Areas of Parallelograms and Triangles
OBJ: 7-1.1 Area of a Parallelogram
STO: KS 1.4.2, KS 2.2.3, KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
TOP: 7-1 Example 1 KEY: area,parallelogram,base,height
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

34. ANS: D DIF: L1 REF: 7-1 Areas of Parallelograms and Triangles
OBJ: 7-1.2 Area of a Triangle
STO: KS 1.4.2, KS 2.2.3, KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
TOP: 7-1 Example 4 KEY: triangle,area
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

35. ANS: C DIF: L1
REF: 7-4 Areas of Trapezoids, Rhombuses, and Kites
OBJ: 7-4.1 Area of a Trapezoid STO: KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
TOP: 7-4 Example 1 KEY: trapezoid,area
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

36. ANS: D DIF: L1
REF: 7-4 Areas of Trapezoids, Rhombuses, and Kites
OBJ: 7-4.1 Area of a Trapezoid STO: KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
TOP: 7-4 Example 1 KEY: trapezoid,area
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

37. ANS: D DIF: L2 REF: 7-1 Areas of Parallelograms and Triangles
OBJ: 7-1.1 Area of a Parallelogram
STO: KS 1.4.2, KS 2.2.3, KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5

TOP: 7-1 Example 1 KEY: area,base,height,parallelogram
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

38. ANS: B DIF: L1 REF: 7-1 Areas of Parallelograms and Triangles
OBJ: 7-1.2 Area of a Triangle
STO: KS 1.4.2, KS 2.2.3, KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
TOP: 7-1 Example 5
KEY: area,triangle,rectangle,formula,word problem,problem solving
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

39. ANS: D DIF: L2
REF: 7-4 Areas of Trapezoids, Rhombuses, and Kites
OBJ: 7-4.2 Finding Areas of Rhombuses and Kites
STO: KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5 TOP: 7-4 Example 4
KEY: rhombus,diagonal,area
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

40. ANS: C DIF: L1 REF: 7-5 Areas of Regular Polygons
OBJ: 7-5.1 Areas of Regular Polygons STO: KS 3.2.2, KS 3.2.3, KS 3.2.4
TOP: 7-5 Example 1 KEY: regular polygon
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

41. ANS: A DIF: L1 REF: 7-5 Areas of Regular Polygons
OBJ: 7-5.1 Areas of Regular Polygons STO: KS 3.2.2, KS 3.2.3, KS 3.2.4
TOP: 7-5 Example 3 KEY: regular polygon,hexagon,area,apothem,radius
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

42. ANS: B DIF: L2 REF: 7-5 Areas of Regular Polygons
OBJ: 7-5.1 Areas of Regular Polygons STO: KS 3.2.2, KS 3.2.3, KS 3.2.4
TOP: 7-5 Example 4 KEY: regular polygon,radius,area,perimeter
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

43. ANS: A DIF: L1 REF: 7-7 Areas of Circles and Sectors
OBJ: 7-7.1 Finding Areas of Circles and Parts of Circles
STO: KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5 TOP: 7-7 Example 1
KEY: area of a circle,radius
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

44. ANS: A DIF: L3 REF: 7-7 Areas of Circles and Sectors

OBJ: 7-7.1 Finding Areas of Circles and Parts of Circles
STO: KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5 TOP: 7-7 Example 2
KEY: sector,circle,area,central angle,word problem,problem solving
MSC: NAEP M1h, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

45. ANS: A DIF: L1 REF: 11-4 Angle Measures and Segment Lengths
OBJ: 11-4.1 Finding Angle Measures STO: KS 3.1.3, KS 3.2.4, KS 3.3.2
TOP: 11-4 Example 1
KEY: circle,secant,angle measure,arc measure,intersection outside the circle
MSC: NAEP G3e, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

46. ANS: B DIF: L1 REF: 10-1 Space Figures and Nets
OBJ: 10-1.1 Identifying Nets of Space Figures
STO: KS 1.4.1, KS 3.2.1, KS 3.2.2, KS 3.2.3, KS 3.2.4
KEY: cube,nets of space figures,net
MSC: NAEP G1b, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14, TV.LV20.17

47. ANS: C DIF: L1 REF: 10-2 Space Figures and Drawings
OBJ: 10-2.1 Drawing Isometric and Orthographic Views
STO: KS 1.4.1, KS 2.4.1, KS 2.4.2, KS 3.1.3, KS 3.2.2, KS 3.2.3, KS 3.3.4, KS 3.3.5
TOP: 10-2 Example 3 KEY: foundation drawing,cube structures
MSC: NAEP G1b, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14, TV.LV20.18

48. ANS: D DIF: L1 REF: 10-3 Surface Areas of Prisms and Cylinders
OBJ: 10-3.1 Finding Surface Area of a Prism
STO: KS 1.4.1, KS 3.2.1, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
TOP: 10-3 Example 2
KEY: surface area formulas,lateral area,surface area,prism,surface area of a prism
MSC: NAEP M1j, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

49. ANS: D DIF: L1 REF: 10-3 Surface Areas of Prisms and Cylinders
OBJ: 10-3.1 Finding Surface Area of a Prism
STO: KS 1.4.1, KS 3.2.1, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
TOP: 10-3 Example 2
KEY: surface area formulas,lateral area,surface area,prism,surface area of a prism
MSC: NAEP M1j, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

50. ANS: D DIF: L1 REF: 10-3 Surface Areas of Prisms and Cylinders
OBJ: 10-3.2 Finding Surface Area of a Cylinder
STO: KS 1.4.1, KS 3.2.1, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
TOP: 10-3 Example 4
KEY: cylinder,lateral area of a cylinder,surface area formulas,word problem,problem solving

MSC: NAEP M1j, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

51. ANS: A DIF: L1 REF: 10-4 Surface Areas of Pyramids and Cones
OBJ: 10-4.2 Finding Surface Area of a Cone
STO: KS 3.2.1, KS 3.2.2, KS 3.2.3, KS 3.2.4 TOP: 10-4 Example 3
KEY: surface area of a cone,surface area formulas,surface area,cone
MSC: NAEP M1j, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

52. ANS: A DIF: L2 REF: 10-5 Volumes of Prisms and Cylinders
OBJ: 10-5.1 Finding Volume of a Prism STO: KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
TOP: 10-5 Example 2
KEY: volume of a triangular prism,volume formulas,volume,prism
MSC: NAEP M1j, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, IT.LV16.PS, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16, TV.LV20.17

53. ANS: A DIF: L1 REF: 10-5 Volumes of Prisms and Cylinders
OBJ: 10-5.2 Finding Volume of a Cylinder
STO: KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5 TOP: 10-5 Example 3
KEY: volume of a cylinder,cylinder,volume formulas,volume
MSC: NAEP M1j, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, IT.LV16.PS, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16, TV.LV20.17

54. ANS: B DIF: L2 REF: 10-5 Volumes of Prisms and Cylinders
OBJ: 10-5.2 Finding Volume of a Cylinder
STO: KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5 TOP: 10-5 Example 3
KEY: cylinder,volume of a cylinder,volume formulas,volume,word problem,problem solving
MSC: NAEP M1j, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, IT.LV16.PS, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16, TV.LV20.17

55. ANS: B DIF: L1 REF: 10-6 Volumes of Pyramids and Cones
OBJ: 10-6.2 Finding Volume of a Cone STO: KS 3.1.1, KS 3.2.4
TOP: 10-6 Example 3
KEY: volume of a cone,oblique cone,volume formulas,volume
MSC: NAEP M1j, CAT5.LV20.46, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, IT.LV16.FR, S9.TSK2.GM, S9.TSK2.NS, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.NS, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.17, TV.LV20.52

56. ANS: A DIF: L1 REF: 10-8 Areas and Volumes of Similar Solids
OBJ: 10-8.1 Finding Relationships in Area and Volume
STO: KS 3.2.3, KS 3.2.4, KS 3.2.9 TOP: 10-8 Example 1
KEY: similar solids,similarity ratio,rectangular prism
MSC: NAEP M2g, CAT5.LV20.50, CAT5.LV20.51, CAT5.LV20.52, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.NS, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.NS, S10.TSK2.PRA, TV.LV20.10, TV.LV20.13, TV.LV20.14,

TV.LV20.52

57. ANS: B DIF: L1 REF: 12-7 Dilations
OBJ: 12-7.1 Locating dilation images STO: KS 3.3.1 TOP: 12-7 Example 1
KEY: dilation,reduction,scale factor
MSC: NAEP G2c, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.NS, S10.TSK2.GM, S10.TSK2.NS, TV.LV20.10, TV.LV20.14, TV.LV20.16

58. ANS: B DIF: L1 REF: 12-7 Dilations
OBJ: 12-7.1 Locating dilation images STO: KS 3.3.1 TOP: 12-7 Example 2
KEY: dilation,enlargement,scale factor,word problem
MSC: NAEP G2c, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.NS, S10.TSK2.GM, S10.TSK2.NS, TV.LV20.10, TV.LV20.14, TV.LV20.16

59. ANS: D DIF: L1 REF: 5-1 Midsegments of Triangles
OBJ: 5-1.1 Using Properties of Midsegments
STO: KS 2.4.1, KS 2.4.2, KS 3.2.9 TOP: 5-1 Example 1
KEY: midpoint,midsegment,Triangle Midsegment Theorem
MSC: NAEP G3f, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.13, TV.LV20.14

60. ANS: B DIF: L1 REF: 5-2 Bisectors in Triangles
OBJ: 5-2.1 Perpendicular Bisectors and Angle Bisectors
STO: KS 1.4.2, KS 2.2.3, KS 3.1.5 TOP: 5-2 Example 2
KEY: angle bisector,Converse of the Angle Bisector Theorem
MSC: NAEP G3b, CAT5.LV20.50, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.14, TV.LV20.16

61. ANS: B DIF: L1 REF: 5-2 Bisectors in Triangles
OBJ: 5-2.1 Perpendicular Bisectors and Angle Bisectors
STO: KS 1.4.2, KS 2.2.3, KS 3.1.5 TOP: 5-2 Example 2
KEY: angle bisector,Angle Bisector Theorem
MSC: NAEP G3b, CAT5.LV20.50, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.14, TV.LV20.16

62. ANS: B DIF: L1 REF: 5-3 Concurrent Lines, Medians, and Altitudes
OBJ: 5-3.1 Properties of Bisectors STO: KS 3.1.5 TOP: 5-3 Example 1
KEY: circumscribe,circumcenter of the triangle
MSC: NAEP G3b, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.13, TV.LV20.14

63. ANS: D DIF: L1
REF: 5-4 Inverses, Contrapositives, and Indirect Reasoning
OBJ: 5-4.1 Writing the Negation, Inverse, and Contrapositive STO: KS 3.1.2
TOP: 5-4 Example 2 KEY: contrapositive
MSC: NAEP G5a, CAT5.LV20.54, IT.LV16.CP, IT.LV16.PS, S9.TSK2.PRA, S10.TSK2.PRA, TV.LV20.16, TV.LV20.17

64. ANS: D DIF: L2
REF: 5-4 Inverses, Contrapositives, and Indirect Reasoning
OBJ: 5-4.1 Writing the Negation, Inverse, and Contrapositive STO: KS 3.1.2
KEY: Venn Diagram,conditional statement,contrapositive
MSC: NAEP G5a, CAT5.LV20.54, IT.LV16.CP, IT.LV16.PS, S9.TSK2.PRA, S10.TSK2.PRA, TV.LV20.16, TV.LV20.17

65. ANS: D DIF: L1 REF: 5-5 Inequalities in Triangles
OBJ: 5-5.1 Inequalities Involving Angles of Triangles STO: KS 1.1.1, KS 2.2.3
TOP: 5-5 Example 2 KEY: Theorem 5-10
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

66. ANS: D DIF: L1 REF: 5-5 Inequalities in Triangles
OBJ: 5-5.1 Inequalities Involving Angles of Triangles STO: KS 1.1.1, KS 2.2.3
TOP: 5-5 Example 2 KEY: word problem,problem solving,Theorem 5-10
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

67. ANS: B DIF: L1 REF: 4-3 Triangle Congruence by ASA and AAS
OBJ: 4-3.1 Using the ASA Postulate and the AAS Theorem STO: KS 3.1.5, KS 3.1.7
TOP: 4-3 Example 1 KEY: ASA
MSC: NAEP G2e, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14

68. ANS: A DIF: L2 REF: 4-3 Triangle Congruence by ASA and AAS
OBJ: 4-3.1 Using the ASA Postulate and the AAS Theorem STO: KS 3.1.5, KS 3.1.7
TOP: 4-3 Example 3 KEY: ASA,AAS,reasoning
MSC: NAEP G2e, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14

69. ANS: B DIF: L2 REF: 4-5 Isosceles and Equilateral Triangles
OBJ: 4-5.1 The Isosceles Triangle Theorems STO: KS 1.4.2, KS 3.1.2
TOP: 4-5 Example 4
KEY: isosceles triangle,Isosceles Triangle Theorem,Polygon Angle-Sum Theorem
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.14, TV.LV20.16

70. ANS: B DIF: L2 REF: 4-5 Isosceles and Equilateral Triangles
OBJ: 4-5.1 The Isosceles Triangle Theorems STO: KS 1.4.2, KS 3.1.2
KEY: equilateral triangle,word problem,problem solving
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.14, TV.LV20.16

71. ANS: A DIF: L1 REF: 4-1 Congruent Figures
OBJ: 4-1.1 Congruent Figures
STO: KS 1.4.2, KS 3.1.2, KS 3.1.5, KS 3.2.9, KS 3.4.1 TOP: 4-1 Example 4
KEY: congruent figures,corresponding parts,proof
MSC: NAEP G2e, CAT5.LV20.50, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.14, TV.LV20.16

SHORT ANSWER

72. ANS:

Answers may vary. Sample: $\overrightarrow{VX}$, $\overrightarrow{XY}$, $\overrightarrow{YZ}$, $\overrightarrow{ZY}$

DIF: L1 REF: 1-3 Segments, Rays, Parallel Lines and Planes
OBJ: 1-3.1 Identifying Segments and Rays STO: KS 3.1.1

TOP: 1-3 Example 1 KEY: point,ray
MSC: NAEP G3g, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14

73. ANS:
87

DIF: L1 REF: 1-4 Measuring Segments and Angles
OBJ: 1-4.1 Finding Segment Lengths
STO: KS 1.4.2, KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.4.1 KEY: segment,segment length
MSC: NAEP M1e, NAEP M1f, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.13, TV.LV20.14

74. ANS:
Answers may vary. Sample: $\angle 1$, $\angle M$, $\angle LMN$

DIF: L1 REF: 1-4 Measuring Segments and Angles
OBJ: 1-4.2 Finding Angle Measures
STO: KS 1.4.2, KS 2.4.1, KS 2.4.2, KS 3.2.2, KS 3.4.1 TOP: 1-4 Example 4
KEY: angle
MSC: NAEP M1e, NAEP M1f, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.13, TV.LV20.14

75. ANS:

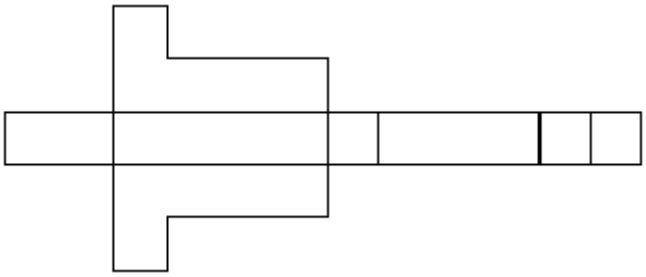
No. Explanations may vary. Sample:
Placing three pieces together forms same-side interior angles with measures of $80°$. Since $80 + 80 \neq 180$, they are not supplementary, so the sides are not parallel.

DIF: L2 REF: 3-2 Proving Lines Parallel
OBJ: 3-2.2 Relating Parallel and Perpendicular Lines STO: KS 2.4.1, KS 2.4.2
TOP: 3-2 Example 5 KEY: word problem,problem solving,parallel lines
MSC: NAEP M1e, NAEP M1f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

76. ANS:
a. 48
b. 112

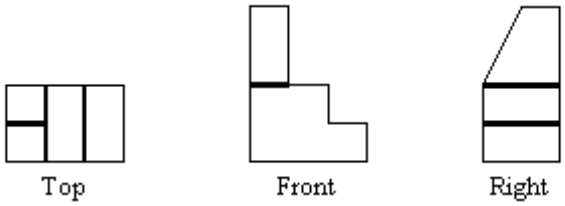
DIF: L1 REF: 11-4 Angle Measures and Segment Lengths
OBJ: 11-4.1 Finding Angle Measures STO: KS 3.1.3, KS 3.2.4, KS 3.3.2
TOP: 11-4 Example 1
KEY: angle measure,angle-arc relationship,arc,arc addition,arc measure,circle,intercepted arc,intersection outside the circle,intersection on the circle,secant,tangent to a circle,multi-part question
MSC: NAEP G3e, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

77. ANS:



DIF: L2 REF: 10-1 Space Figures and Nets
OBJ: 10-1.1 Identifying Nets of Space Figures
STO: KS 1.4.1, KS 3.2.1, KS 3.2.2, KS 3.2.3, KS 3.2.4 TOP: 10-1 Example 2
KEY: net
MSC: NAEP G1b, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14, TV.LV20.17

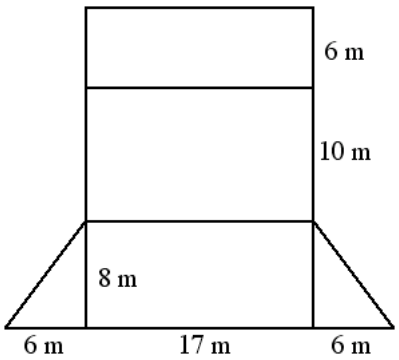
78. ANS:



DIF: L1 REF: 10-2 Space Figures and Drawings
OBJ: 10-2.1 Drawing Isometric and Orthographic Views
STO: KS 1.4.1, KS 2.4.1, KS 2.4.2, KS 3.1.3, KS 3.2.2, KS 3.2.3, KS 3.3.4, KS 3.3.5
TOP: 10-2 Example 2 KEY: isometric drawing,orthographic drawing
MSC: NAEP G1b, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14, TV.LV20.18

79. ANS:

a.



b. 456 m^2

DIF: L1 REF: 10-3 Surface Areas of Prisms and Cylinders
OBJ: 10-3.1 Finding Surface Area of a Prism

STO: KS 1.4.1, KS 3.2.1, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
TOP: 10-3 Example 1
KEY: surface area of a prism,prism,surface area,net,multi-part question
MSC: NAEP M1j, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

80. ANS:
Yes; $\Delta PQS \cong \Delta RQS$ by SAS.

DIF: L2 REF: 4-2 Triangle Congruence by SSS and SAS
OBJ: 4-2.1 Using the SSS and SAS Postulates STO: KS 3.1.5, KS 3.1.7
KEY: SAS,proof,reasoning
MSC: NAEP G2e, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14

81. ANS:
Answers may vary. Sample: Because the two triangles share the side $\overline{AC}$, they are congruent by SAS. Then $\angle D \cong \angle B$ by CPCTC.

DIF: L1 REF: 4-4 Using Congruent Triangles: CPCTC
OBJ: 4-4.1 Proving Parts of Triangles Congruent STO: KS 2.4.1, KS 2.4.2
TOP: 4-4 Example 2 KEY: CPCTC,SAS,writing in math,reasoning
MSC: NAEP G2e, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14

82. ANS:
$\Delta PQT \cong \Delta RQT$

DIF: L2 REF: 4-7 Using Corresponding Parts of Congruent Triangles
OBJ: 4-7.2 Using Two Pairs of Congruent Triangles
STO: KS 3.1.2, KS 3.1.5, KS 3.2.9 KEY: overlapping triangles,congruent figures,AAS
MSC: NAEP G3f, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.13, TV.LV20.14

ESSAY

83. ANS:
[4] By the definition of $\perp$, $r \perp s$ implies $m\angle 2 = 90$, and $t \perp s$ implies $m\angle 6 = 90$. Line s is a transversal. $\angle 2$ and $\angle 6$ are corresponding angles. By the Converse of the Corresponding Angles Postulate, $r \parallel t$.
[3] correct idea, some details inaccurate
[2] correct idea, not well organized
[1] correct idea, one or more significant steps omitted

DIF: L3 REF: 3-2 Proving Lines Parallel
OBJ: 3-2.2 Relating Parallel and Perpendicular Lines STO: KS 2.4.1, KS 2.4.2
TOP: 3-2 Example 3
KEY: paragraph proof,proof,reasoning,extended response,rubric-based question,perpendicular lines

MSC: NAEP M1e, NAEP M1f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

84. ANS:

[4] Answers may vary. Sample:
The height of the ladder by the first building is

$$8^2 + h^2 = 16^2$$

$$h^2 = 192$$

$$h = \sqrt{192}$$

The height of the ladder by the second building is

$$4^2 + h^2 = 16^2$$

$$h^2 = 240$$

$$h = \sqrt{240}$$

$$\sqrt{240} - \sqrt{192} \approx 2$$

The second ladder goes about 2 feet higher than the first ladder.

[3] correct methods, but error in computation

[2] error in method used

[1] correct answer but work not shown

DIF: L2 REF: 7-2 The Pythagorean Theorem and Its Converse
OBJ: 7-2.1 The Pythagorean Theorem
STO: KS 1.4.2, KS 2.2.3, KS 3.1.6, KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.4.5
TOP: 7-2 Example 3
KEY: Pythagorean Theorem,extended response,rubric-based question,word problem,problem solving
MSC: NAEP G3d, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.52

85. ANS:

[4] **a.** To find the actual dimensions, you must use the scale of 1 cm to 0.5 meters. A quick way to find the dimensions is to divide each value of a measure by 2 and then that is the number of meters in the dimension for the cabin.

$14 \div 2 = 7$, so this is 7 meters.
$20 \div 2 = 10$, so this is 10 meters.
$7 \div 2 = 3.5$, so this is 3.5 meters.

The dimensions of the actual cabin are 7 m by 10 m by 3.5 m.

b. To find the volume of the cabin, use the formula for volume of a prism.

$V = Bh$ Use the formula for volume.

$= 70 \cdot 3.5 \qquad B = 7 \cdot 10 = 70$

$= 245$

The volume of the cabin is 245 cubic meters.

c. To find the ratio, you must know the volume of each cabin in the same units. The volume of the model is $14 \text{ cm} \cdot 20 \text{ cm} \cdot 7 \text{ cm} = 1960$ cubic centimeters. The volume of the actual cabin is

$$245 \text{ cm}^3 \cdot 100 \frac{\text{cm}}{\text{m}} \cdot 100 \frac{\text{cm}}{\text{m}} \cdot 100 \frac{\text{cm}}{\text{m}} = 245{,}000{,}000 \text{ cubic centimeters,}$$

since each meter is 100 centimeters.

$$\text{ratio of model to actual} = \frac{1960}{245,000,000}$$

$$= \frac{1}{125,000}$$

The ratio of the volumes is 1 to 125,000.

[3] one mathematical error or correct answers with incomplete explanations
[2] two mathematical errors or correct answers with errors in explanation
[1] correct answers with no explanation

DIF: L2 REF: 10-5 Volumes of Prisms and Cylinders
OBJ: 10-5.1 Finding Volume of a Prism STO: KS 3.2.2, KS 3.2.3, KS 3.2.4, KS 3.2.5
KEY: extended response,volume of a rectangular prism,prism,problem solving,word problem,rubric-based question,volume formulas,volume
MSC: NAEP M1j, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, IT.LV16.PS, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16, TV.LV20.17

86. ANS:

[4] You need to find the volume of the bottom cone. If the two cones together are 12 cm tall, then one cone has height 6 cm. Use a formula to find the volume.
Volume of the bottom cone:

$V = \frac{1}{3}\pi r^2 h$ Use the formula for volume of a cone.

$V = \frac{1}{3}\pi(3)^2(6)$ Substitute 3 for r and 6 for h.

$V \approx 56.55$ Use a calculator.

Volume of $\frac{2}{3}$ of the cone:

$V \approx \frac{2}{3}(56.55) = 37.7$

The amount of salt is about 37.7 cm^3.

[3] one mathematical error or correct calculations with incomplete explanations
[2] two mathematical errors or correct calculations with errors in explanation
[1] correct answer with no explanation

DIF: L2 REF: 10-6 Volumes of Pyramids and Cones
OBJ: 10-6.2 Finding Volume of a Cone STO: KS 3.1.1, KS 3.2.4
KEY: rubric-based question,extended response,cone,volume of a cone,problem solving,word problem,volume formulas,volume
MSC: NAEP M1j, CAT5.LV20.46, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, IT.LV16.FR, S9.TSK2.GM, S9.TSK2.NS, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.NS, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.17, TV.LV20.52

87. ANS:
[4]

Statement	Reason
1. $\angle BAC \cong \angle DAC$ and $\angle DCA \cong \angle BCA$	1. Given
2. $\overline{CA} \cong \overline{CA}$	2. Reflexive Property
3. $\Delta CBA \cong \Delta CDA$	3. ASA
4. $\overline{BC} \cong \overline{CD}$	4. CPCTC

[3] correct idea, some details inaccurate
[2] correct idea, not well organized
[1] correct idea, one or more significant steps omitted

DIF: L3 REF: 4-4 Using Congruent Triangles: CPCTC
OBJ: 4-4.1 Proving Parts of Triangles Congruent STO: KS 2.4.1, KS 2.4.2
KEY: ASA,CPCTC,congruent figures,corresponding parts,rubric-based question,extended response,proof
MSC: NAEP G2e, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.14

88. ANS:
[4]

Statement	Reason
1. $\overline{BC} \cong \overline{DA}$	1. Given
2. $\angle 1 \cong \angle 2$	2. Given
3. $\angle BEC \cong \angle DEA$	3. Vertical angles are congruent.
4. $\Delta BEC \cong \Delta DEA$	4. AAS
5. $\overline{CE} \cong \overline{AE}$	5. CPCTC
6. $\overline{CF} \cong \overline{AF}$	6. Given
7. $\overline{EF} \cong \overline{EF}$	7. Reflexive Property
8. $\Delta CFE \cong \Delta AFE$	8. SSS

[3] correct idea, some details inaccurate
[2] correct idea, not well organized
[1] correct idea, one or more significant steps omitted

DIF: L3 REF: 4-7 Using Corresponding Parts of Congruent Triangles
OBJ: 4-7.2 Using Two Pairs of Congruent Triangles
STO: KS 3.1.2, KS 3.1.5, KS 3.2.9 TOP: 4-7 Example 3
KEY: AAS,CPCTC,corresponding parts,congruent figures,proof,rubric-based question,extended response
MSC: NAEP G3f, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.CP, S9.TSK2.GM, S10.TSK2.GM, TV.LV20.13, TV.LV20.14

OTHER

89. ANS:
$m\angle 1 + m\angle 2 + m\angle 3 = 180$. Given $m\angle 1 + m\angle 2 = m\angle 3$, by substitution, $m\angle 3 + m\angle 3 = 180$.
$2m\angle 3 = 180$, and $m\angle 3 = 90$. Thus, $\angle 3$ is a right angle, and the triangle is a right triangle.

DIF: L3 REF: 3-3 Parallel Lines and the Triangle Angle-Sum Theorem
OBJ: 3-3.1 Finding Angle Measures in Triangles STO: KS 1.4.2, KS 3.4.1
KEY: Triangle Angle-Sum Theorem,reasoning,writing in math
MSC: NAEP G3b, NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

90. ANS:
Yes; the quadrilateral could be a parallelogram. Tick marks are used to show congruent segments. Different tick marks do not mean different lengths. If the quadrilateral were a parallelogram, the two sides with different tick marks would be congruent.

DIF: L3 REF: 6-4 Special Parallelograms
OBJ: 6-4.2 Is the Parallelogram a Rhombus or a Rectangle? TOP: 6-4 Example 3
KEY: parallelogram,writing in math,reasoning
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

91. ANS:
Let m, $m + 1$, $m + 2$, and $m + 3$ represent the four consecutive numbers. Then the product of the greatest and least numbers will equal the product of the two consecutive middle numbers. Solving the equation $m(m + 3) = (m + 1)(m + 2)$ for m results in $m^2 + 3m = m^2 + 3m + 2$, or $0 = 2$, which is false.

DIF: L3 REF: 11-4 Angle Measures and Segment Lengths
OBJ: 11-4.1 Finding Angle Measures STO: KS 3.1.3, KS 3.2.4, KS 3.3.2
TOP: 11-4 Example 3
KEY: circle,intersection inside the circle,segment length,algebra,proof,reasoning
MSC: NAEP G3e, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16

92. ANS:

$\angle R$, $\angle Q$, $\angle P$. Sample: Since $x = QR > 0$, $x < x + 2 < 3x + 2$, so $QR < RP < PQ$. The largest angle ($\angle R$) is opposite PQ, the next largest angle ($\angle Q$) is opposite RP.

DIF: L2 REF: 5-5 Inequalities in Triangles
OBJ: 5-5.1 Inequalities Involving Angles of Triangles STO: KS 1.1.1, KS 2.2.3
KEY: Theorem 5-10,reasoning,multi-part question
MSC: NAEP G3f, CAT5.LV20.50, CAT5.LV20.55, CAT5.LV20.56, IT.LV16.AM, IT.LV16.CP, S9.TSK2.GM, S9.TSK2.PRA, S10.TSK2.GM, S10.TSK2.PRA, TV.LV20.13, TV.LV20.14, TV.LV20.16