

Geometry Review

Practice set · 97 questions

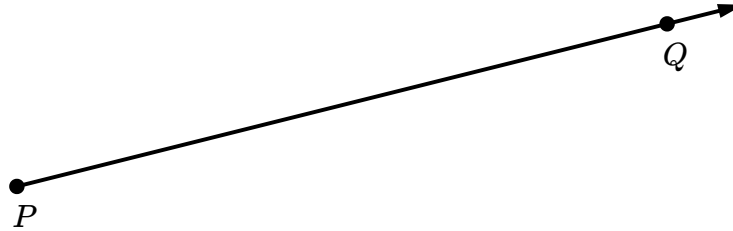
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Unit 1: Tools of Geometry

1. Which notation correctly names the figure shown?



A. $\overline{PQ}$

B. $\overrightarrow{QP}$

C. $\overrightarrow{PQ}$

D. $\overleftarrow{PQ}$

2. Points A , B , and C are collinear. Which equation guarantees that B is between A and C ?

A. $AB + BC = AC$

B. $AB + AC = BC$

C. $AC + BC = AB$

D. $AB = BC$

3. A surveyor marks point M as the midpoint of a straight property line $\overline{GH}$. She measures $GM = 5x - 4$ and $MH = 3x + 10$ in feet. What is the length of the whole property line GH ?

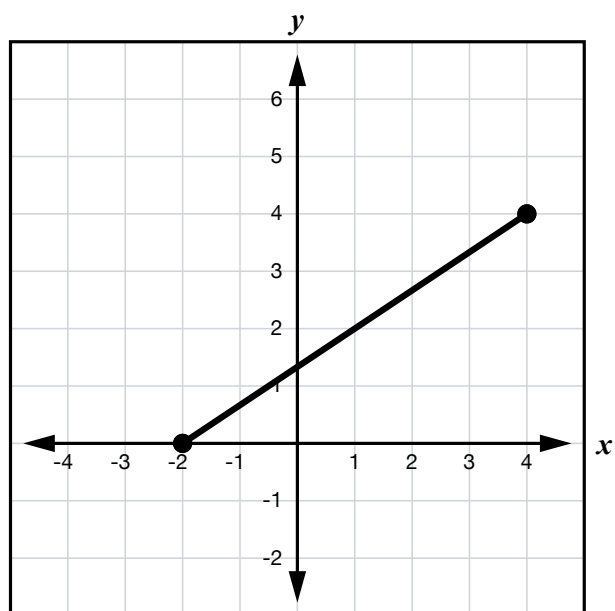
A. 31 feet

B. 124 feet

C. 7 feet

D. 62 feet

4. What is the midpoint of the segment shown?



A. $(2, 3)$

B. $(4, 5)$

C. $(-1, 1)$

D. $(1, 2)$

5. Point P lies on the segment from $A(3, -5)$ to $B(15, 7)$ so that $AP : PB = 5 : 1$. What are the coordinates of P ?

A. $(5, -3)$

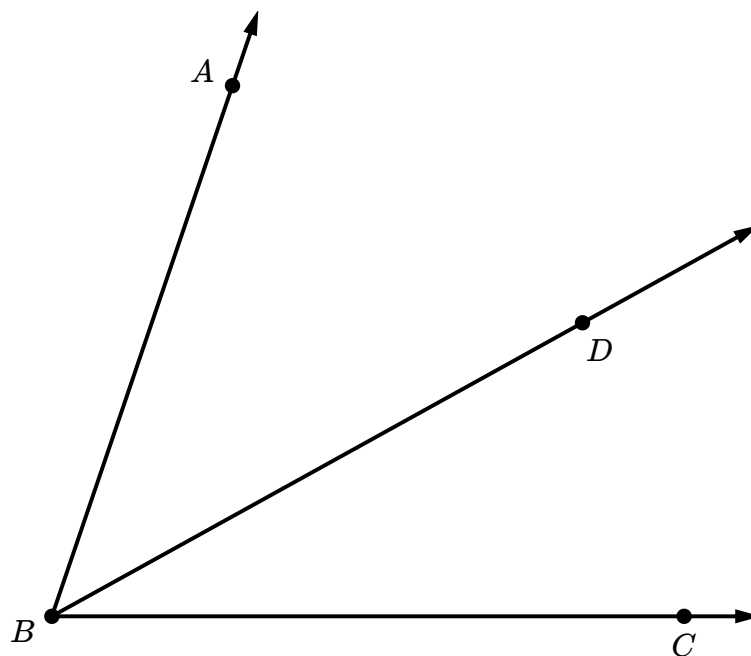
B. $(10, 10)$

C. $(13, 5)$

D. $(9, 1)$

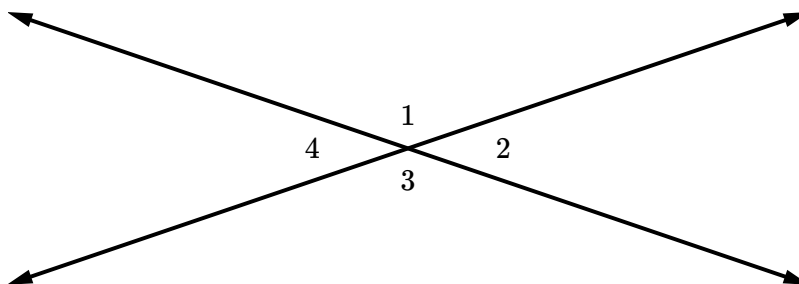
Unit 2: Angles

6. In the figure, $m\angle ABD = 42^\circ$ and $m\angle DBC = 29^\circ$. What is $m\angle ABC$?



- A. 71° B. 13°
C. 61° D. 81°

7. Two lines intersect as shown. How are $\angle 1$ and $\angle 2$ related?



- A. They form a linear pair. B. They are vertical angles.
C. They are complementary. D. They are congruent.

8. How many sides does an octagon have?

A. 6

B. 8

C. 7

D. 10

9. Which of these solids is a polyhedron?

A. Rectangular prism

B. Cylinder

C. Sphere

D. Cone

Unit 3: Proof & Parallel Lines

10. A student examines several specific examples, notices a pattern, and writes a conjecture based on that pattern. Which type of reasoning is the student using?

- A. Deductive reasoning
- B. Inductive reasoning
- C. Indirect reasoning
- D. Algebraic reasoning

11. Complete the truth table for $p \vee q$ shown. How many rows have a value of true?

p	q	$p \vee q$
T	T	?
T	F	?
F	T	?
F	F	?

- A. 2
- B. 1
- C. 3
- D. 4

12. Which is the if-then form of the statement “All right angles measure 90° ”?

- A. If an angle measures 90° , then it is a right angle.
- B. If an angle is a right angle, then it measures 90° .
- C. If an angle is not a right angle, then it does not measure 90° .
- D. An angle measures 90° only sometimes.

13. For which true conditional is the converse false?

- A. If an angle measures 90° , then it is a right angle.
- B. If a shape is a square, then it has four sides.
- C. If a triangle has three congruent sides, then it is equilateral.
- D. If a polygon has exactly three sides, then it is a triangle.

14. A line in a proof reads “ $\overline{XY} \cong \overline{XY}$.” Which reason justifies a figure being congruent to itself?

- A. Transitive Property
- B. Symmetric Property
- C. Reflexive Property
- D. Substitution Property

15. Which property justifies the following statement:

$$\text{If } x + 15 = 40, \text{ then } x = 25$$

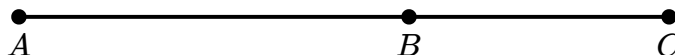
A. Addition Property of Equality

B. Division Property of Equality

C. Subtraction Property of Equality

D. Symmetric Property of Equality

16. In the figure, B lies between A and C , with $AB = 2x + 3$, $BC = 9$, and $AC = 24$. Which equation is justified by the Segment Addition Postulate?



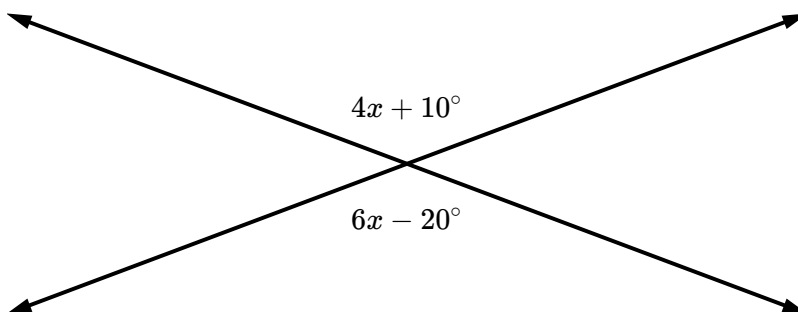
A. $(2x + 3) + 9 = 24$

B. $2x + 3 = 9$

C. $(2x + 3) - 9 = 24$

D. $2x + 3 = 24$

17. In the figure, two lines intersect, forming the vertical angles shown. What is the value of x ?



A. 19

B. 15

C. 5

D. 3

18. Line a is parallel to line b . Which notation states this correctly?

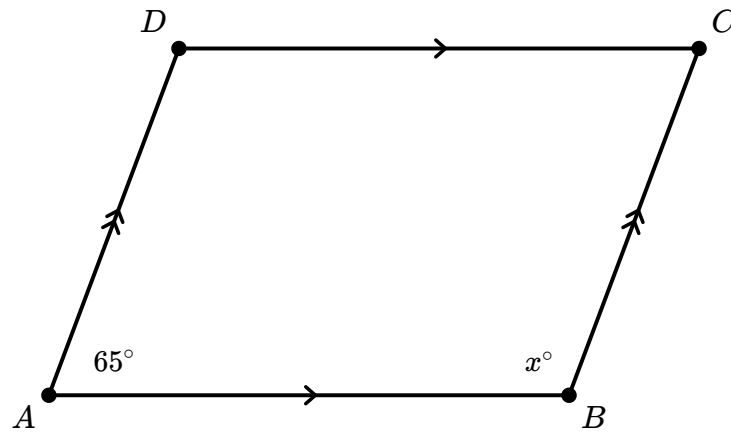
A. $a \parallel b$

B. $a \perp b$

C. $a \cong b$

D. $a = b$

19. In the figure, the quadrilateral is a parallelogram, so its opposite sides are parallel. One angle measures 65° . Find the measure of the angle next to it (a consecutive angle).



- A. 65° B. 25°
C. 115° D. 105°

20. What is the slope of any line parallel to the line $y = 3x - 4$?

- A. -3 B. 3
C. $\frac{1}{3}$ D. -4

21. A transversal crosses two lines, forming same-side interior angles that measure 105° and $5x^\circ$. For which value of x are the two lines parallel?

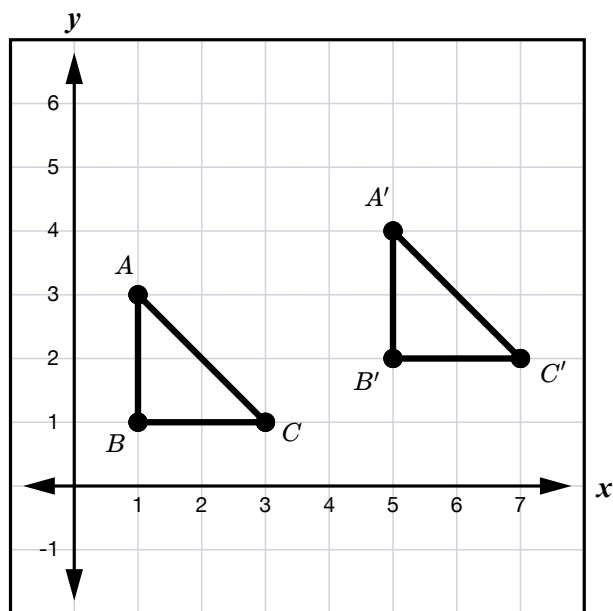
- A. 21 B. 57
C. 9 D. 15

22. What is the distance from the point $P(-5, 4)$ to the line $x = 2$?

- A. 9 B. 3
C. 7 D. 4

Unit 4: Transformations & Symmetry

23. Which transformation slides every point of a figure the same distance in the same direction?



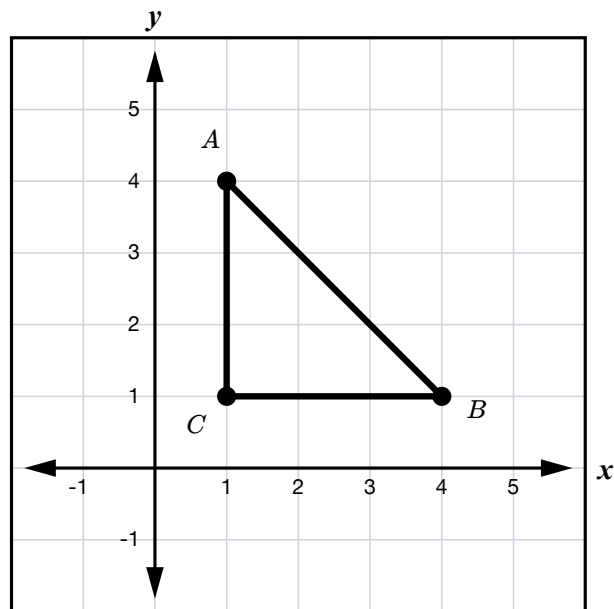
A. Rotation

B. Reflection

C. Dilation

D. Translation

- 24.** Triangle ABC is shown. It is translated by the rule $(x, y) \rightarrow (x - 3, y + 2)$. What are the coordinates of B' ?



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

- 25.** What is the image of the point $(-4, 2)$ after a reflection across the y -axis?

- A.** $(-4, -2)$ **B.** $(2, -4)$
C. $(4, 2)$ **D.** $(4, -2)$

- 26.** What is the image of the point $(6, 1)$ after a rotation of 90° counterclockwise about the point $(4, 1)$?

- A.** $(4, -1)$ **B.** $(2, 1)$
C. $(-1, 6)$ **D.** $(4, 3)$

- 27.** A figure is reflected across a line and then reflected again across a second line parallel to the first. Which single transformation is equivalent to this composition?

- A.** A rotation **B.** A translation
C. A reflection **D.** A dilation

28. Which figure has rotational symmetry but no line of symmetry?

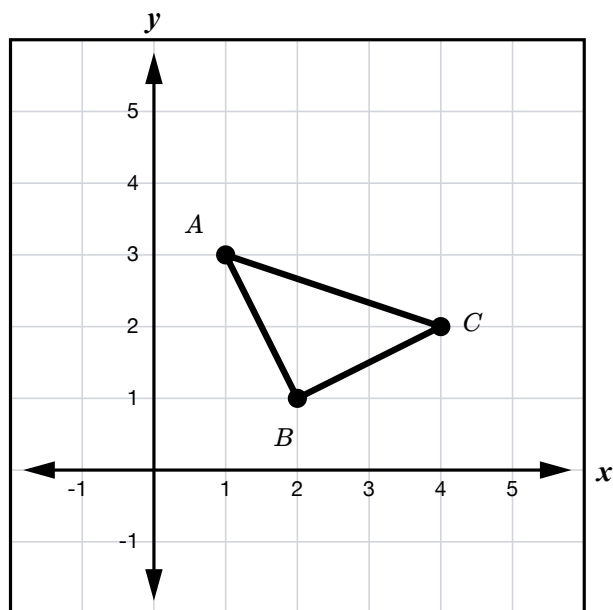
A. An isosceles triangle

B. A rhombus

C. A regular hexagon

D. A general parallelogram

29. Triangle ABC is shown on the coordinate plane. The triangle is dilated by a scale factor of 3 centered at the origin. What are the coordinates of B' ?



A. (5, 4)

B. $\left(\frac{2}{3}, \frac{1}{3}\right)$

C. (6, 1)

D. (6, 3)

Unit 5: Congruent Triangles

30. Two angles of a triangle measure 52° and 68° . What is the measure of the third angle?

- A. 120°
- B. 240°
- C. 60°
- D. 70°

31. In $\triangle ABC \cong \triangle DEF$, the sides of $\triangle ABC$ measure $AB = 5$, $BC = 9$, and $CA = 7$. What is the perimeter of $\triangle DEF$?

- A. 10.5
- B. 42
- C. It cannot be determined without the side lengths of $\triangle DEF$.
- D. 21

32. In $\triangle ABC$ and $\triangle DEF$, $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, and $\overline{AC} \cong \overline{DF}$. Which criterion proves the triangles congruent?

- A. ASA
- B. SAS
- C. SSS
- D. AAS

33. Two triangles have two pairs of corresponding angles congruent and one pair of corresponding sides congruent. Must the triangles be congruent?

- A. Yes — two angles and any one pair of corresponding sides force congruence, by either ASA or AAS.
- B. Only if the congruent side lies between the two angles.
- C. Only if the two triangles are right triangles.
- D. No — matching angles never guarantee congruence.

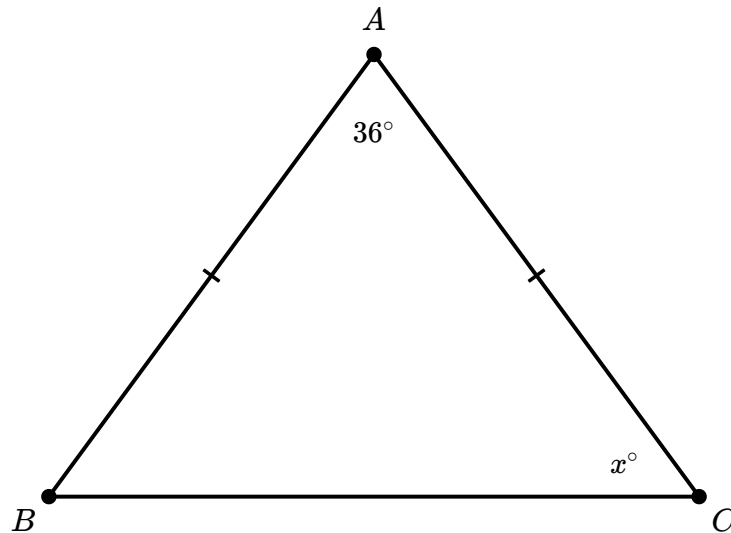
34. Two ladders lean against a wall. Each ladder is 20 ft long, and each one reaches 16 ft up the vertical wall. The wall meets the level ground at a right angle. Which criterion proves the two ladder triangles congruent?

- A. HL
- B. SAS
- C. AAS
- D. There is not enough information to guarantee congruence.

35. $\overline{XY}$ bisects $\overline{PQ}$ at point R . Which reason justifies the statement $\overline{PR} \cong \overline{RQ}$?

- A. Definition of angle bisector
- B. Reflexive Property
- C. Definition of segment bisector
- D. CPCTC

36. Find the value of x .



- A. 72
- B. 36
- C. 144
- D. 54

37. Two adjacent sides of a figure have slopes $\frac{1}{2}$ and -2 . What kind of angle do they form where they meet?

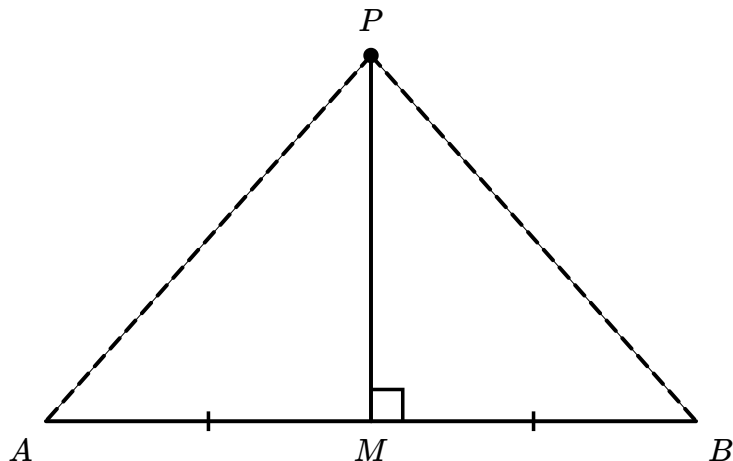
- A. A right angle
- B. An acute angle
- C. A straight angle
- D. The sides are parallel.

38. A quadrilateral has vertices $(0, 0)$, $(a, 0)$, $(a + b, c)$, and (b, c) . Which computation proves it is a parallelogram?

- A. All four sides have length a , so it is a parallelogram.
- B. The bottom side has slope 0 and the left side has slope $\frac{c}{b}$, so the sides are perpendicular.
- C. The two diagonals both have length $\sqrt{a^2 + c^2}$, so it is a parallelogram.
- D. The bottom and top sides both have slope 0, and the left and right sides both have slope $\frac{c}{b}$, so both pairs of opposite sides are parallel.

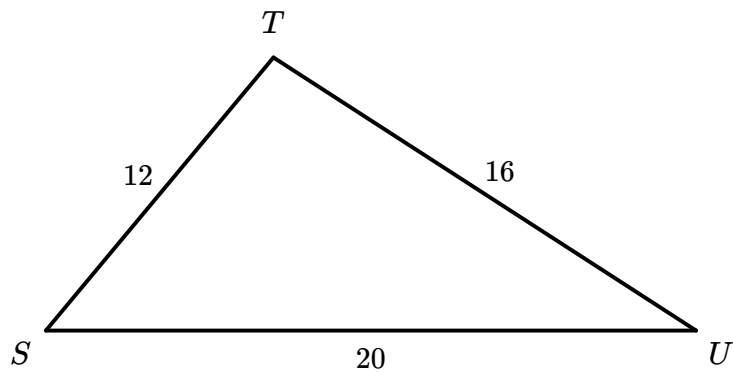
Unit 6: Triangle Relationships

39. In the figure, P lies on the perpendicular bisector of $\overline{AB}$, $PA = 4x - 3$, and $PB = 2x + 9$. What is PA ?



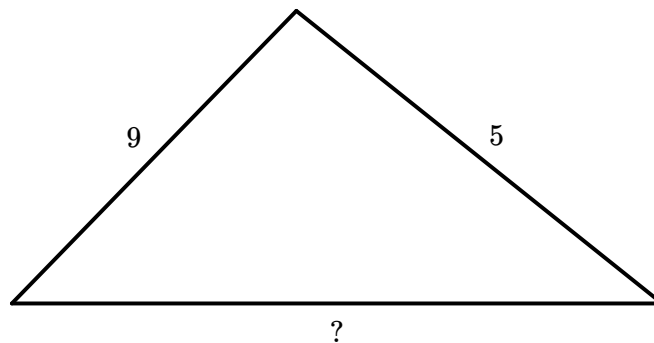
- A. 9
B. 6
C. 21
D. 42
40. The center of a triangle's inscribed circle is the intersection of which three segments?
- A. The perpendicular bisectors of the sides
B. The angle bisectors
C. The medians
D. The altitudes
41. A median of a triangle measures 24 units. How far is the centroid from the midpoint of the opposite side?
- A. 16
B. 12
C. 8
D. 6

42. The side lengths of $\triangle STU$ are shown. List the angles in order from largest to smallest.



- A. $\angle U, \angle S, \angle T$
B. $\angle T, \angle S, \angle U$
C. $\angle T, \angle U, \angle S$
D. $\angle S, \angle T, \angle U$

43. In the triangle shown, two sides are given and the third is marked. What is the greatest whole-number length the marked side can be?



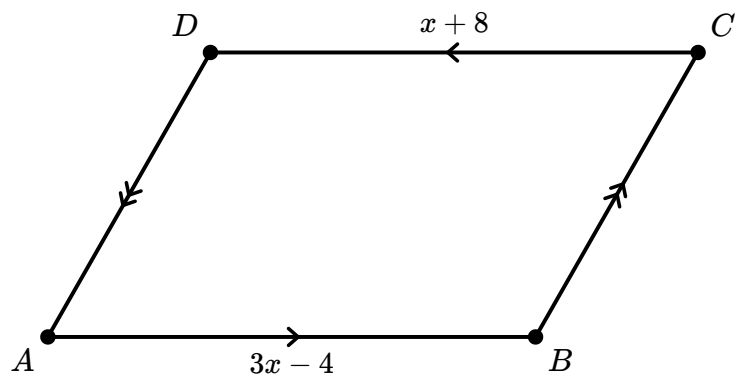
- A. 14
B. 13
C. 4
D. 5

Unit 7: Quadrilaterals

44. What is the sum of the interior angle measures of a hexagon?

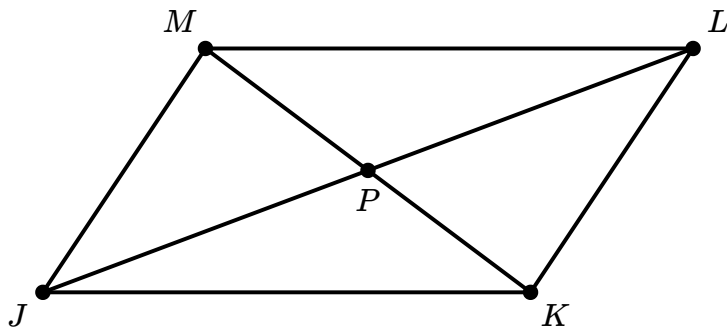
- A. $1,080^\circ$ B. 360°
C. 720° D. 540°

45. In the parallelogram shown, what is the value of x ?



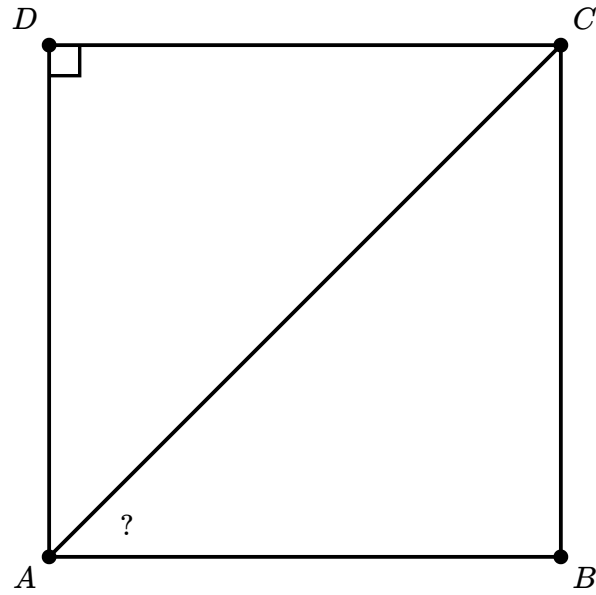
- A. 6 B. 3
C. 14 D. 12

46. The diagonals of quadrilateral $JKLM$ intersect at P , with $JP = 4x$ and $PL = 2x + 10$. What value of x makes diagonal $\overline{JL}$ bisected at P ?



- A. 10 B. 5
C. 20 D. 2.5

47. A diagonal is drawn in the square shown. What is the measure of the marked angle between the diagonal and a side?



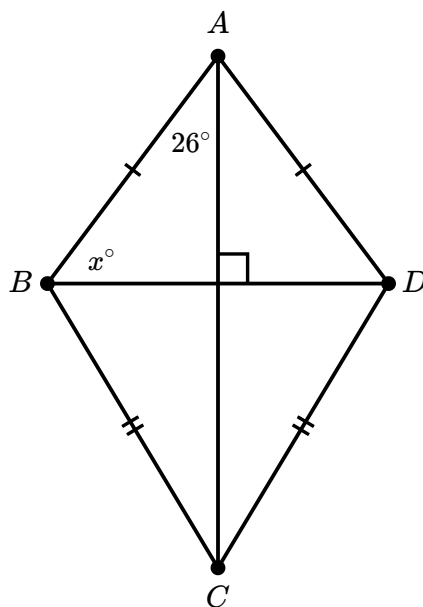
A. 90°

B. 60°

C. 45°

D. 30°

48. In the kite shown, the diagonals meet at a right angle. What is the value of x ?



- A. 26
B. 116
C. 64
D. 32
49. A trapezoidal tabletop has parallel edges measuring 40 cm and 60 cm. A support bar runs straight across the midpoints of the two slanted sides. How long is the support bar?
- A. 100 cm
B. 50 cm
C. 10 cm
D. 20 cm

Unit 8: Similarity

50. $ABCD \sim WXYZ$. If $AB = 6$, $WX = 9$, and $BC = 8$, what is XY ?

- A. 12
- B. 11
- C. $\frac{16}{3}$
- D. 6

51. A tree 20 ft tall casts an 8-ft shadow. A nearby mailbox casts a 2-ft shadow at the same time. How tall is the mailbox?

- A. 2.5 ft
- B. 4 ft
- C. 5 ft
- D. 10 ft

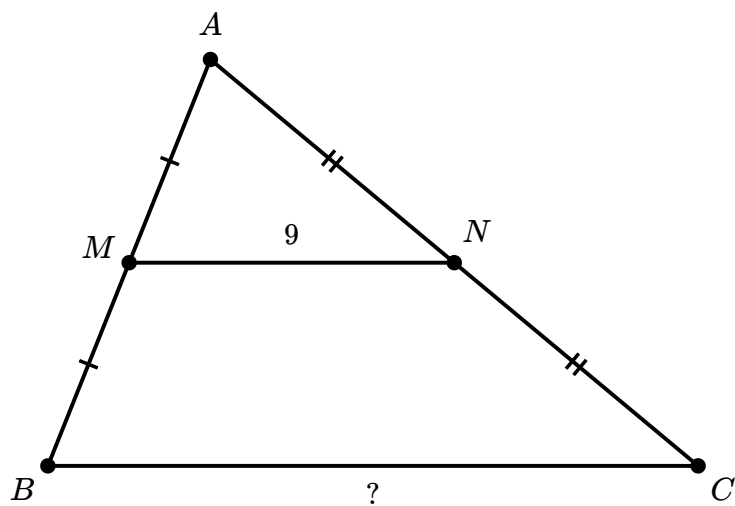
52. In $\triangle GHK$ and $\triangle LMN$, $\angle H \cong \angle M$, $GH = 8$, $HK = 12$, $LM = 6$, and $MN = 9$. Are the triangles similar?

- A. Yes, by SSS — all three sides are proportional.
- B. No — the sides are not congruent.
- C. Yes, by SAS — the sides around the equal angle are proportional.
- D. There is not enough information to decide.

53. A carpenter braces a triangular truss with a beam parallel to the base. The beam meets the left rafter 3 ft from the peak, and the rest of that rafter is 5 ft. On the right rafter the beam sits 4.5 ft from the peak. How much rafter remains below the beam on the right?

- A. 2.7 ft
- B. 6 ft
- C. 7.5 ft
- D. 9 ft

54. In the figure, M and N are midpoints. Find the length of $\overline{BC}$.



- A. 4.5
C. 9

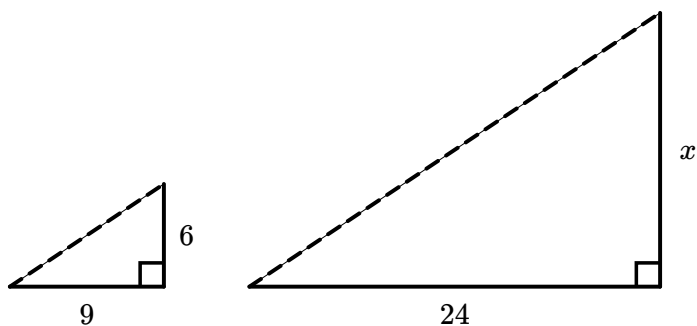
- B. 18
D. 36

55. Two similar triangular banners have areas of 8 ft^2 and 50 ft^2 . What is the ratio of their corresponding sides?

- A. 4 : 25
C. 2 : 5

- B. 8 : 50
D. 1 : 6

56. The figure shows a person and a tree with their shadows at the same time of day. What is the height of the tree?



- A. 36 ft
C. 18 ft

- B. 16 ft
D. 21 ft

Unit 9: Right Triangles & Trig

57. What is the geometric mean of 4 and 25?

- A. 14.5
- B. $\sqrt{29}$
- C. 100
- D. 10

58. A triangle has side lengths 4, 5, and 6. Classify the triangle by its angles.

- A. Right
- B. Acute
- C. Obtuse
- D. Cannot be determined

59. Each leg of a 45-45-90 triangle measures 12. What is the length of the hypotenuse?

- A. 24
- B. 12
- C. $12\sqrt{2}$
- D. $6\sqrt{2}$

60. In a 30-60-90 triangle, the short leg is the side opposite which angle?

- A. The 90° angle
- B. The 60° angle
- C. Either acute angle
- D. The 30° angle

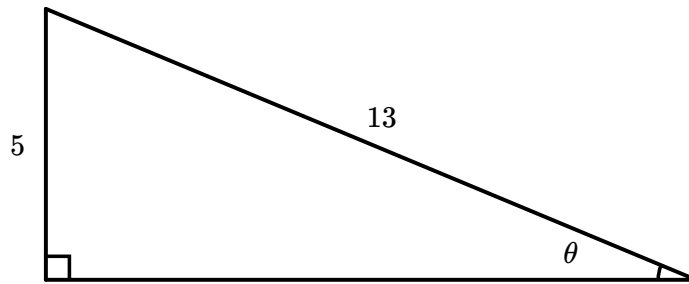
61. Which trigonometric ratio uses the side opposite an acute angle and the side adjacent to it?

- A. Tangent
- B. Sine
- C. Cosine
- D. Hypotenuse

62. To find the width of a river, a surveyor stands directly across from a landmark, then walks 60 ft along the bank. From there, the angle to the landmark measures 68° . How wide is the river, to the nearest tenth?

- A. 55.6 ft
- B. 22.5 ft
- C. 24.2 ft
- D. 148.5 ft

63. What is the measure of θ in the triangle shown, to the nearest tenth of a degree?



A. 67.4°

B. 21.0°

C. 24.6°

D. 22.6°

64. To find the height of a tower, Marcus stands 90 ft from its base and measures a 52° angle of elevation to the top. He computes $90 \cos 52^\circ \approx 55.4$ ft, but this is incorrect. What is the correct height, to the nearest tenth?

A. 55.4 ft

B. 70.9 ft

C. 146.2 ft

D. 115.2 ft

65. A triangle problem gives two angles and one side. Which method finds a missing side?

A. Law of Sines

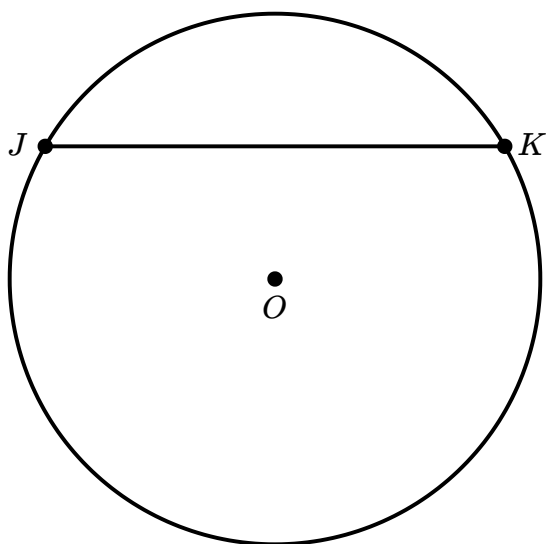
B. Law of Cosines

C. Pythagorean Theorem

D. SOH-CAH-TOA

Unit 10: Circles

66. Which term best describes $\overline{JK}$ in circle O ?



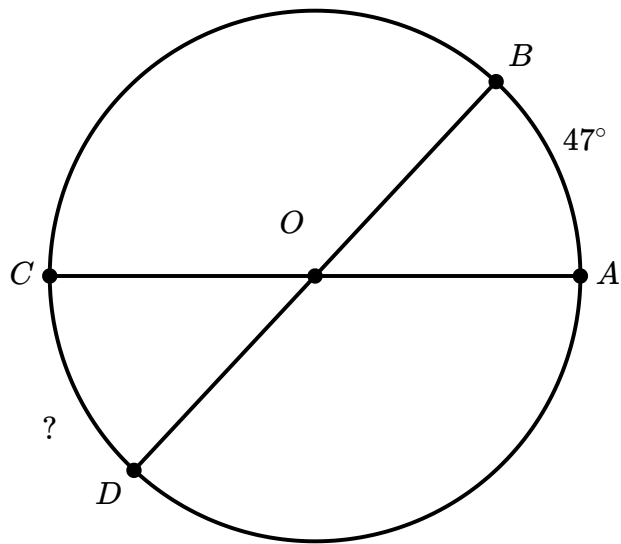
A. Radius

B. Diameter

C. Chord

D. Tangent

67. In circle O , $\angle AOB \cong \angle COD$ and $m\widehat{AB} = 47^\circ$. What is $m\widehat{CD}$?



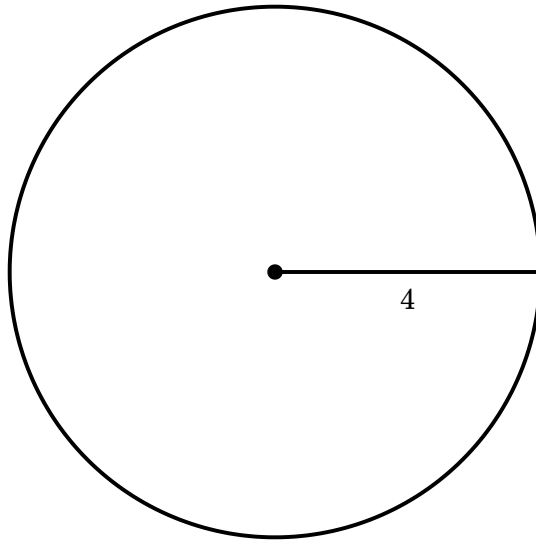
A. 94°

B. 23.5°

C. 47°

D. 133°

68. What is the circumference of the circle shown?



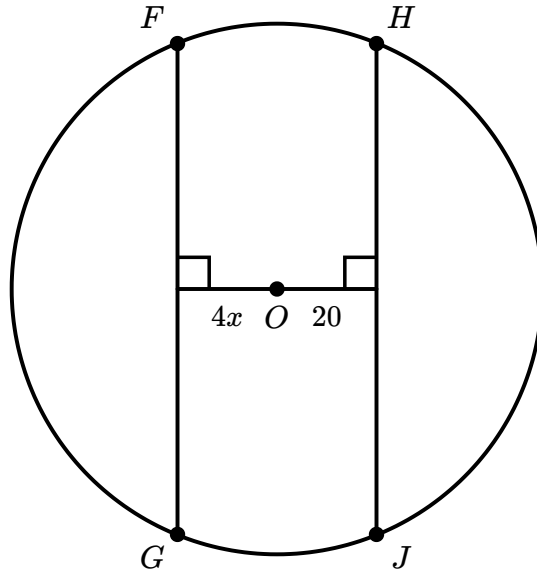
A. 4π

B. 8π

C. 16π

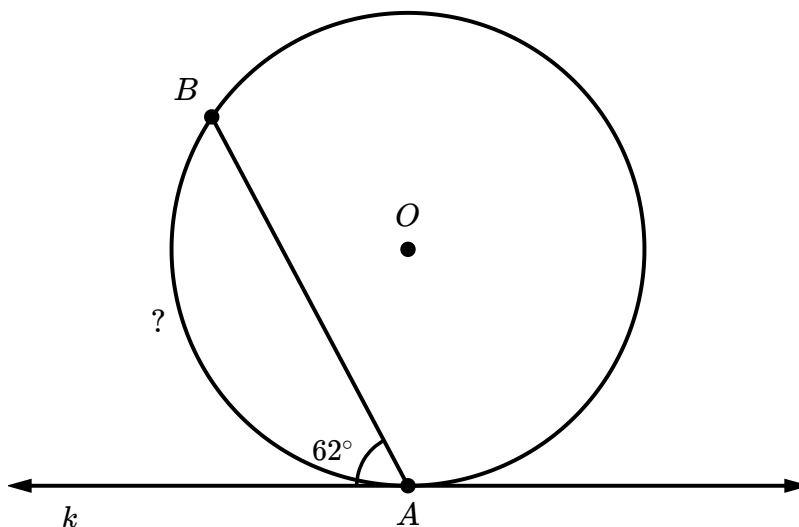
D. 2π

69. In circle O , the two chords shown are congruent. What is the value of x ?



- A. 5
B. 80
C. 10
D. 4

72. Line k is tangent to circle O at A , and the angle between the tangent and chord $\overline{AB}$ measures 62° . What is the measure of arc AB ?



- A. 124° B. 31°
C. 62° D. 118°

73. A tangent segment from an external point has length 15. A secant from the same point crosses the circle so its far intersection is 25 units from the point. How far from the point does the secant first enter the circle?

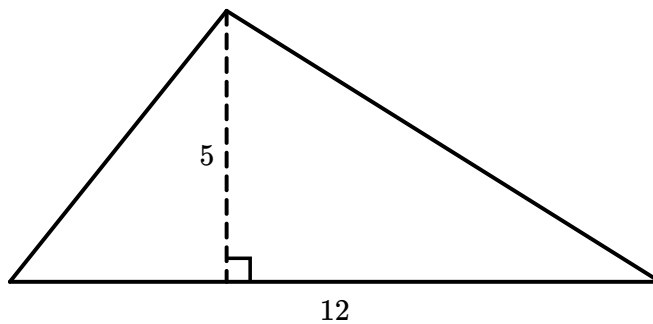
- A. 9 B. 10
C. 15 D. 6

74. Which equation represents a circle with center $(-3, 7)$ and radius 6?

- A. $(x - 3)^2 + (y + 7)^2 = 36$ B. $(x + 3)^2 + (y - 7)^2 = 6$
C. $(x + 3)^2 + (y - 7)^2 = 36$ D. $(x - 3)^2 + (y + 7)^2 = 6$

Unit 11: Area & Volume

75. What is the area of the triangle shown, in square units?



A. 60

B. 30

C. 17

D. 34

76. A square has vertices $(0, 0)$, $(5, 0)$, $(5, 5)$, and $(0, 5)$. What is its perimeter, in units?

A. 20

B. 25

C. 10

D. 15

77. A regular pentagon has a side length of 12 and an apothem of 8.3. What is its area, in square units?

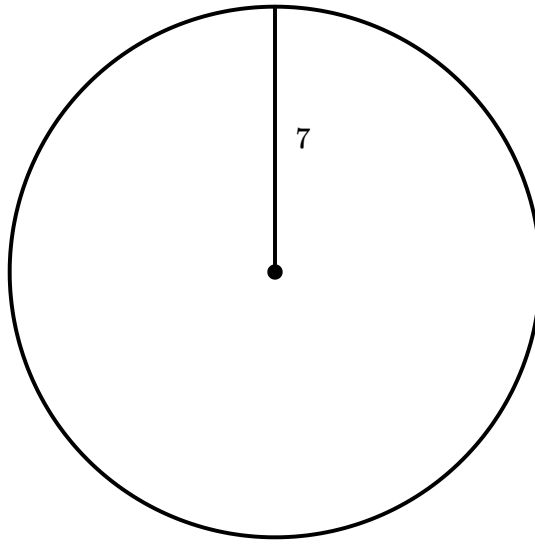
A. 249

B. 498

C. 99.6

D. 49.8

78. A circular pizza has the radius shown. What is its area, in terms of π ?



- A. 14π
- C. 196π

- B. 49π
- D. 7π

79. A sector has a central angle of 60° and a radius of 6. What is its area, in terms of π ?

- A. 6π
- C. 12π

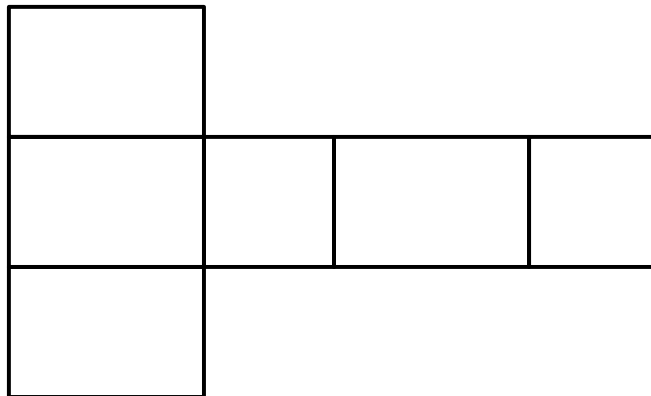
- B. 36π
- D. 3π

80. A garden is a 12-meter by 9-meter rectangle with a right-triangle plot attached to one 9-meter side. The triangle's legs are the shared 9-meter side and a 12-meter extension of the rectangle's base. How many meters of fencing are needed to enclose the whole garden?

- A. 66 m
- C. 54 m

- B. 69 m
- D. 60 m

81. Which solid does the net shown fold into?



A. Cube

B. Triangular prism

C. Rectangular prism

D. Rectangular pyramid

82. The flat outline of an ice cream treat is a triangle with a semicircular dome resting on top. Rotating this outline 360° about its vertical center line forms which solid?

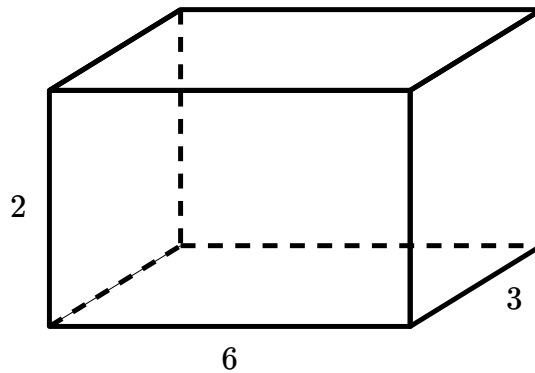
A. A cone topped by a hemisphere

B. A cone topped by a full sphere

C. A cylinder topped by a cone

D. Two cones joined at their bases

83. Find the surface area of the rectangular prism shown, in square units.



A. 36

B. 132

C. 66

D. 72

84. When finding the surface area of a cone or pyramid, which measurement do you use for the slanted faces?

A. The vertical height

B. The base perimeter

C. The radius

D. The slant height

85. Two prisms have the same height, and at every level their cross-sections have equal areas. What must be true of their volumes?

A. The taller-looking one is greater.

B. It cannot be determined.

C. Their volumes are equal.

D. One is three times the other.

86. A cylinder has a radius of 2 and a height of 5. Using $\pi \approx 3.14$, what is its volume to the nearest tenth?

A. 31.4

B. 125.6

C. 62.8

D. 15.7

87. A square pyramid has a base edge of 4 and a height of 9. What is its volume?

A. 144

B. 36

C. 48

D. 16

88. If the radius of a sphere is doubled, how does its volume change?

A. It doubles.

B. It becomes four times as large.

C. It becomes six times as large.

D. It becomes eight times as large.

89. After a dilation by a scale factor of 3, a triangle has an area of 45 square units. What was the area of the original triangle, in square units?

A. 15

B. 135

C. 5

D. 405

90. Two similar storage boxes have corresponding edges of 6 inches and 9 inches. The smaller box has a volume of 48 cubic inches. What is the volume of the larger box, in cubic inches?

A. 72

B. 108

C. 324

D. 162

91. The table shows the mass and volume of three metal samples. Which sample has the greatest density?

Sample	Mass (g)	Volume (cm ³)
<i>A</i>	120	40
<i>B</i>	90	10
<i>C</i>	130	50

A. Sample A

B. Sample B

C. Sample C

D. All three samples have the same density.

Unit 12: Probability

92. A standard six-sided number cube is rolled once. What is the probability of rolling a number greater than 4?

A. $\frac{1}{6}$
C. $\frac{1}{2}$

B. $\frac{2}{3}$
D. $\frac{1}{3}$

93. A dart lands at random on a rectangular board that is 16 in wide and 10 in tall. A shaded triangle has a base of 16 in and a height of 5 in. What is the probability the dart lands in the triangle?

A. $\frac{1}{4}$
C. $\frac{1}{8}$

B. $\frac{1}{2}$
D. $\frac{3}{8}$

94. A restaurant offers 5 entrees and 4 desserts. How many different meals of one entree and one dessert are possible?

A. 9
C. 45

B. 20
D. 54

95. A student claims that $P(A \mid B)$ always equals $P(B \mid A)$. Using $P(A \cap B) = 0.2$, $P(A) = 0.8$, and $P(B) = 0.4$, what is the correct value of $P(A \mid B)$?

A. 0.25
C. 0.2

B. 0.5
D. 0.8

96. One card is drawn from a standard deck of 52. What is the probability the card is a king or a queen?

A. $\frac{1}{13}$
C. $\frac{2}{13}$

B. $\frac{1}{26}$
D. $\frac{1}{169}$

97. A student is chosen at random from all 50 students. A student computes the probability the student is a senior who chose choir as $\frac{16}{26}$. What is the correct probability?

Elective Choice by Grade

	Band	Choir	Total
Junior	15	10	25
Senior	9	16	25
Total	24	26	50

A. $\frac{8}{25}$
C. $\frac{16}{25}$

B. $\frac{8}{13}$
D. $\frac{1}{2}$

Answer Key

Unit 1: Tools of Geometry

1. **C** 2. **A** 3. **D** 4. **D** 5. **C**

Unit 2: Angles

6. **A** 7. **A** 8. **B** 9. **A**

Unit 3: Proof & Parallel Lines

10. **B** 11. **C** 12. **B** 13. **B** 14. **C** 15. **C**
16. **A** 17. **B** 18. **A** 19. **C** 20. **B** 21. **D**
22. **C**

Unit 4: Transformations & Symmetry

23. **D** 24. **B** 25. **C** 26. **D** 27. **B** 28. **D**
29. **D**

Unit 5: Congruent Triangles

30. **C** 31. **D** 32. **C** 33. **A** 34. **A** 35. **C**
36. **A** 37. **A** 38. **D**

Unit 6: Triangle Relationships

39. **C** 40. **B** 41. **C** 42. **B** 43. **B**

Unit 7: Quadrilaterals

44. **C** 45. **A** 46. **B** 47. **C** 48. **C** 49. **B**

Unit 8: Similarity

50. **A** 51. **C** 52. **C** 53. **C** 54. **B** 55. **C**
56. **B**

Unit 9: Right Triangles & Trig

57. **D** 58. **B** 59. **C** 60. **D** 61. **A** 62. **D**
63. **D** 64. **D** 65. **A**

Unit 10: Circles

66. C	67. C	68. B	69. A	70. A	71. C
72. A	73. A	74. C			

Unit 11: Area & Volume

75. B	76. A	77. A	78. B	79. A	80. D
81. C	82. A	83. D	84. D	85. C	86. C
87. C	88. D	89. C	90. D	91. B	

Unit 12: Probability

92. D	93. A	94. B	95. B	96. C	97. A
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