

1. Which word best describes the figure?



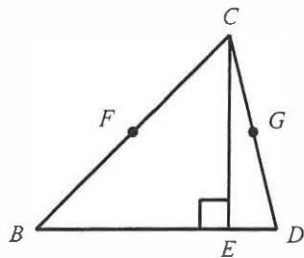
- [A] plane                      [B] point                      [C] line                      [D] ray

2. Which word best describes the figure?



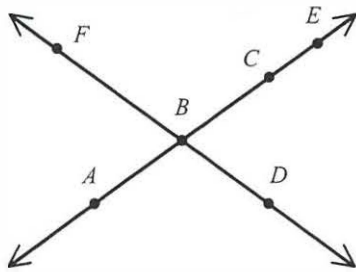
- [A] line                      [B] plane                      [C] point                      [D] ray

3. Which set of three points is noncollinear?



- [A] C, D, G                      [B] B, E, D                      [C] B, F, C                      [D] C, F, E

4. Which set of three points is collinear?



- [A] A, B, D                      [B] B, E, D                      [C] C, F, E                      [D] A, C, E

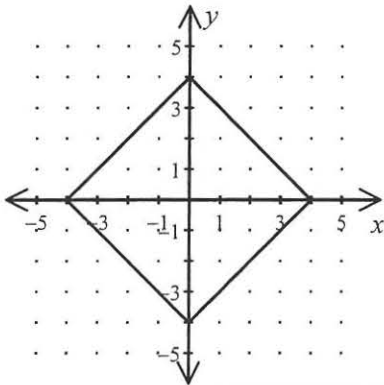
5. Which figure shows  $\overrightarrow{AB}$ ?



6. Which figure shows  $\overline{AB}$ ?



7. Determine which coordinates are the midpoints of the sides of the quadrilateral.



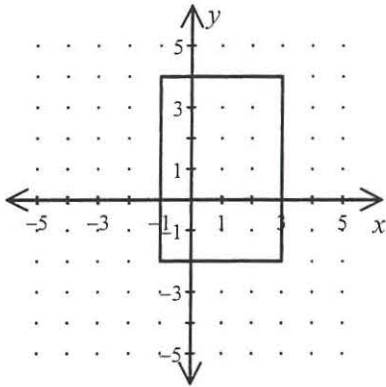
[A]  $(-2, 2), (2, 2), (2, -2), (-2, -2)$

[B]  $(3, -1), (3, 1), (-3, 1), (-3, -1)$

[C]  $(-1, 3), (1, 3), (1, -3), (-1, -3)$

[D]  $(4, 0), (0, -4), (-4, 0), (0, 4)$

8. Determine which coordinates are the midpoints of the sides of the quadrilateral.



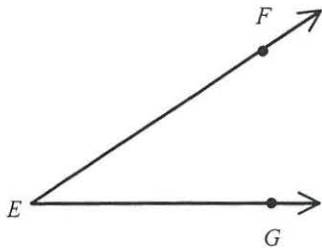
[A]  $(1, -1), (-1, -4), (-3, -1), (-1, 2)$

[C]  $(-1, 1), (-4, -1), (-1, -3), (2, -1)$

[B]  $(-1, 1), (1, 4), (3, 1), (1, -2)$

[D]  $(1, -1), (4, 1), (1, 3), (-2, 1)$

9. Name this angle in three different ways.



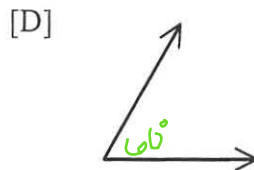
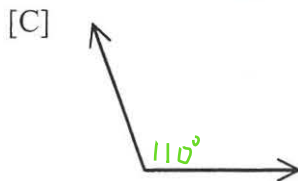
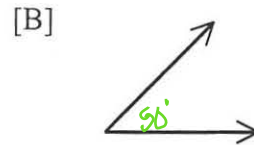
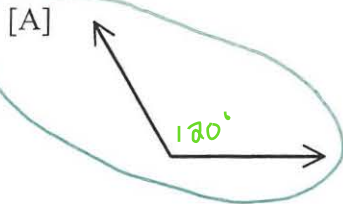
[A]  $\angle FEG, \angle GEF, \angle E$

[C]  $\angle FGE, \angle GFE, \angle F$

[B]  $\angle FGE, \angle GFE, \angle E$

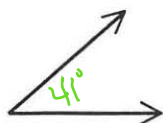
[D]  $\angle FEG, \angle GEF, \angle F$

10. Use a protractor and straightedge to determine which angle measures  $120^\circ$ .

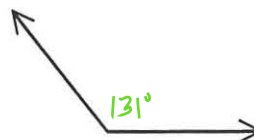


11. Use a protractor and straightedge to determine which angle measures  $51^\circ$ .

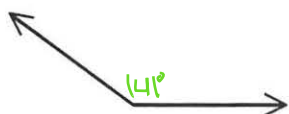
[A]



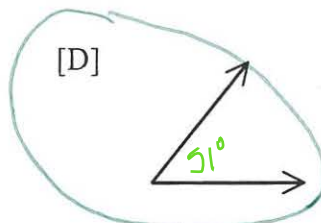
[B]



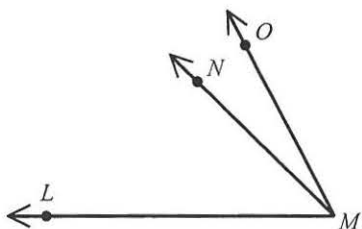
[C]



[D]



12. Find  $m\angle OMN$  and  $m\angle LMN$  if  $m\angle OMN = (2x + 6)^\circ$ ,  $m\angle LMN = (8x - 4)^\circ$ , and  $m\angle OML = 62^\circ$ .



$$2x + 6 + 8x - 4 = 62$$

$$10x + 2 = 62$$

$$10x = 60$$

$$x = 6$$

$$2(6) + 6 = 18$$

$$8(6) - 4 = 44$$

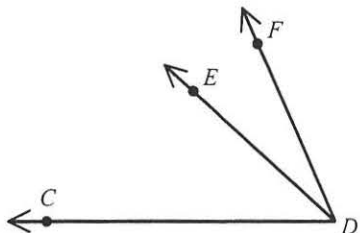
[A]  $m\angle OMN = 20^\circ$  and  $m\angle LMN = 52^\circ$

[B]  $m\angle OMN = 18^\circ$  and  $m\angle LMN = 44^\circ$

[C]  $m\angle OMN = 20^\circ$  and  $m\angle LMN = 44^\circ$

[D]  $m\angle OMN = 18^\circ$  and  $m\angle LMN = 52^\circ$

13. Find  $m\angle FDE$  and  $m\angle CDE$  if  $m\angle FDE = (2x + 8)^\circ$ ,  $m\angle CDE = (6x - 6)^\circ$ , and  $m\angle FDC = 66^\circ$ .



$$2x + 8 + 6x - 6 = 66$$

$$8x + 2 = 66$$

$$8x = 64$$

$$x = 8$$

$$2(8) + 8 = 24$$

$$6(8) - 6 = 42$$

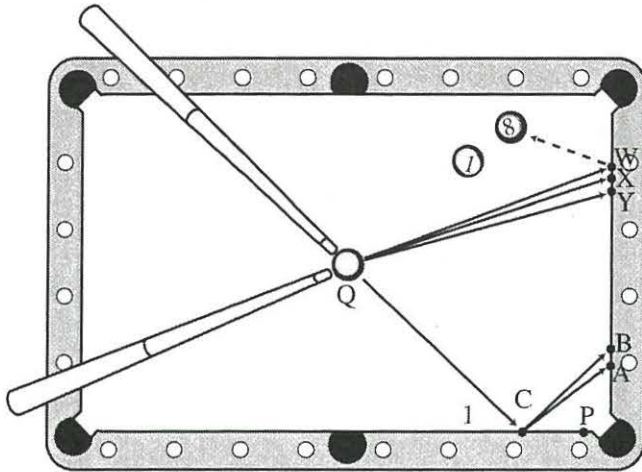
[A]  $m\angle FDE = 24^\circ$  and  $m\angle CDE = 42^\circ$

[B]  $m\angle FDE = 24^\circ$  and  $m\angle CDE = 48^\circ$

[C]  $m\angle FDE = 26^\circ$  and  $m\angle CDE = 48^\circ$

[D]  $m\angle FDE = 26^\circ$  and  $m\angle CDE = 42^\circ$

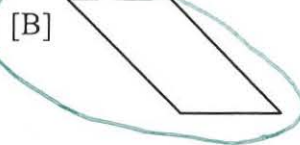
14. If you hit the white ball, placed at any location on the table, in an attempt to strike the 8-ball, and the white ball hit point  $X$  at a  $55^\circ$  incoming angle, how many degrees off would the white ball miss the 8-ball?



$$\begin{array}{r} 63 \\ - 55 \\ \hline 8 \end{array}$$

- [A] approximately  $8^\circ$  [B] approximately  $12^\circ$   
 [C] approximately  $55^\circ$  [D] It would not miss the 8-ball.

15. Which is a counterexample to the definition below?  
 A rectangle is a figure with 2 pairs of congruent sides.



[D] There is no counterexample for this definition.

16. Determine whether the statement is true or false. If it is false, choose the correct counterexample.

Any number that is divisible by 2 is also divisible by 4.

[A] True

[B] False. One counterexample is 16.

[C] False. One counterexample is 454.

[D] False. One counterexample is 88.

17. Which is a counterexample to the following faulty definition?

A square is a figure with four right angles.

[A] Octagons are figures.

[B] Rectangles also have four right angles.

[C] A line connects two points.

[D] A triangle has three angles.

18. Which is a counterexample to the following faulty definition?

A circle is a figure that is round.

[A] Some ellipses are small.

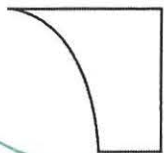
[B] A circle can be big.

[C] Ovals or ellipses are also round.

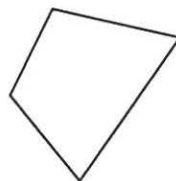
[D] A square is a figure.

19. Which is a concave non-polygonal figure?

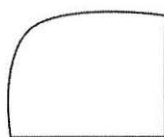
[A]



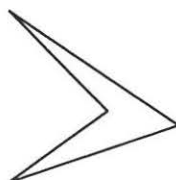
[B]



[C]

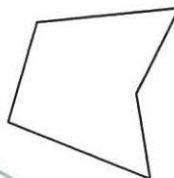


[D]

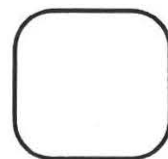


20. Which is a concave polygon?

[A]



[B]



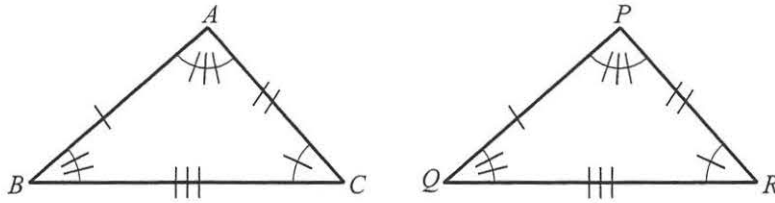
[C]



[D]

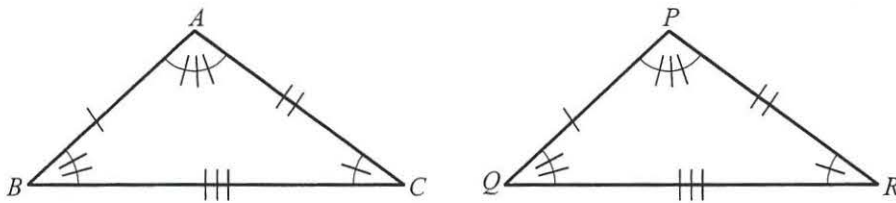


21. Find a congruence statement for the two triangles. Then, determine whether  $\overline{BC}$  and  $\overline{QR}$  represent corresponding angles, corresponding sides, or neither.



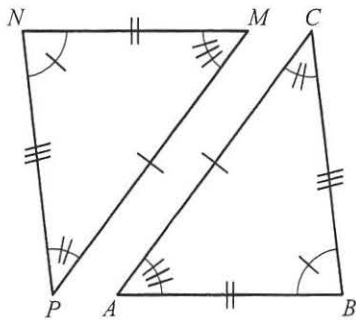
- [A]  $\triangle ABC \cong \triangle PQR$ ; corresponding angles  
 [B]  $\triangle ACB \cong \triangle PQR$ ; corresponding angles  
 [C]  $\triangle ABC \cong \triangle PQR$ ; corresponding sides  
 [D]  $\triangle ACB \cong \triangle PQR$ ; corresponding sides

22. Find a congruence statement for the two triangles. Then, determine whether  $\angle B$  and  $\angle Q$  represent corresponding angles, corresponding sides, or neither.



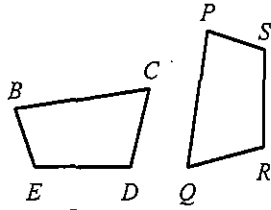
- [A]  $\triangle ACB \cong \triangle PQR$ ; corresponding angles      [B]  $\triangle ABC \cong \triangle PQR$ ; neither  
 [C]  $\triangle ACB \cong \triangle PQR$ ; neither      [D]  $\triangle ABC \cong \triangle PQR$ ; corresponding angles

23.  $\triangle ABC \cong$  \_\_\_



- [A]  $\triangle NMP$       [B]  $\triangle NPM$       [C]  $\triangle MNP$       [D]  $\triangle CAB$

24. If  $BCDE$  is congruent to  $PQRS$ , which statement is true?



$$\begin{array}{l} \overline{BC} \cong \overline{PQ} \\ \overline{CD} \cong \overline{QR} \\ \overline{DE} \cong \overline{RS} \\ \overline{BE} \cong \overline{PS} \end{array}$$

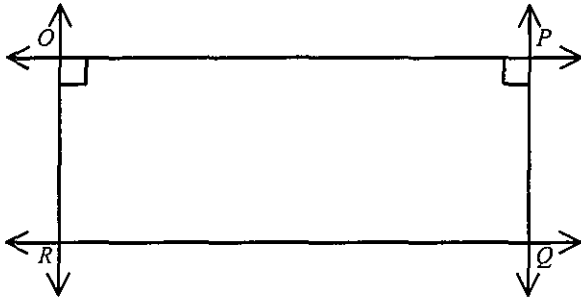
[A]  $\overline{DE}$  is congruent to  $\overline{RS}$ .

[B]  $\overline{BC}$  is congruent to  $\overline{QR}$ .

[C]  $\overline{DE}$  is congruent to  $\overline{PS}$ .

[D]  $\overline{BE}$  is congruent to  $\overline{PQ}$ .

25. Based on the marks in the diagram below, which pairs of lines can you assume perpendicular?



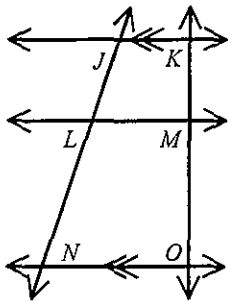
[A]  $\overrightarrow{RO}$  is perpendicular to  $\overrightarrow{OP}$  only

[B]  $\overrightarrow{OP}$  is perpendicular to  $\overrightarrow{PQ}$  only

[C]  $\overrightarrow{RO}$  is perpendicular to  $\overrightarrow{OP}$  and  $\overrightarrow{OP}$  is perpendicular to  $\overrightarrow{PQ}$

[D] cannot assume any lines perpendicular

26. Based on the marks in the diagram below, which pairs of lines can you assume parallel?



[A]  $\overrightarrow{JK}$  is parallel to  $\overrightarrow{NO}$

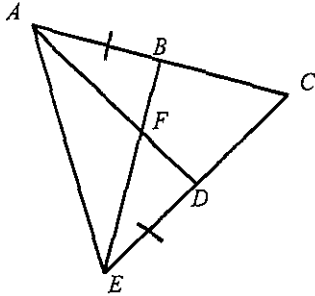
[B]  $\overrightarrow{JK}$  is parallel to  $\overrightarrow{LM}$

[C]  $\overrightarrow{NO}$  is parallel to  $\overrightarrow{LM}$

[D] cannot assume any lines parallel



27. Based on the marks in the diagram below, which angles can you assume congruent?



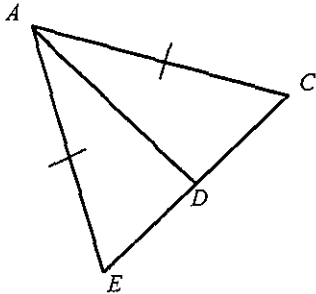
[A]  $\angle BFA \cong \angle DFE$  and  $\angle BFD \cong \angle AFE$

[B]  $\angle C$  and  $\angle DEA$

[C]  $\angle C$  and  $\angle BAE$

[D]  $\angle BAE$  and  $\angle DEA$

28. Based on the marks in the diagram below, which sides can you assume congruent?



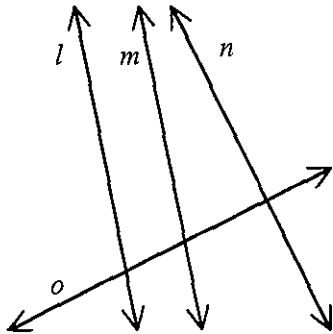
[A]  $\overline{AE} \cong \overline{AC}$

[B]  $\overline{CE} \cong \overline{AE}$

[C]  $\overline{AE} \cong \overline{DC}$

[D]  $\overline{CA} \cong \overline{CE}$

29. Based on the marks in the diagram below, which lines can you assume parallel?



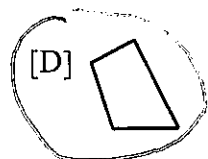
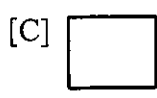
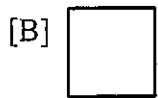
[A] line  $o$  and line  $n$

[B] line  $l$  and line  $n$

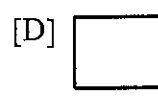
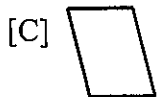
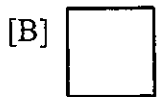
[C] line  $l$  and line  $m$

[D] cannot assume any lines parallel

30. Which figure is a quadrilateral with no special name?



31. Which figure is not a parallelogram?



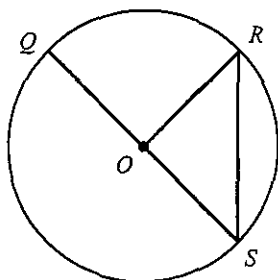
32. Find a radius of the circle.

[A]  $O$

[B]  $\overline{QS}$

[C]  $\overline{OR}$

[D]  $\overline{RS}$



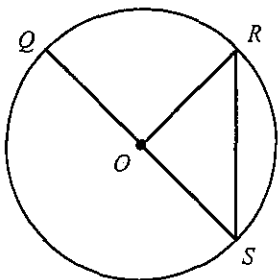
33. Find the center of the circle.

[A]  $\overline{RS}$

[B]  $\overline{SQ}$

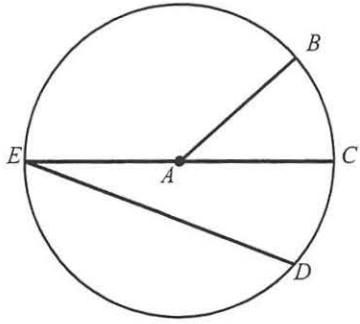
[C]  $\overline{QS}$

[D]  $O$

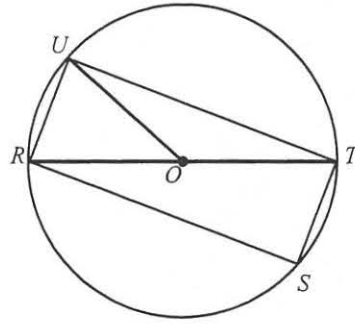


34. Which figure shows center  $A$  and radius  $\overline{AD}$ ?

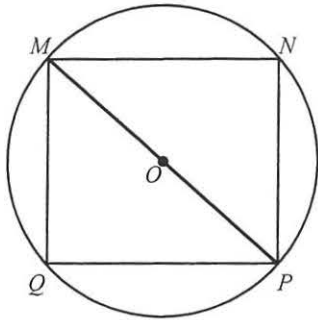
[A]



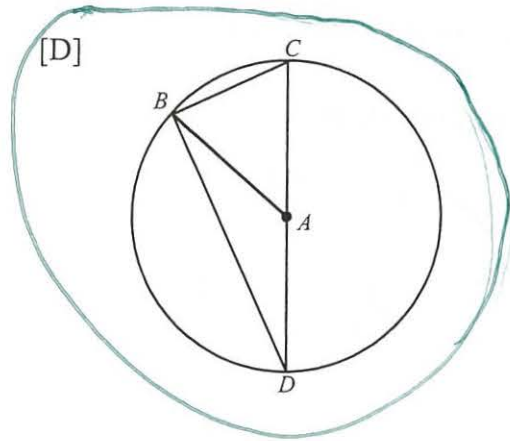
[B]



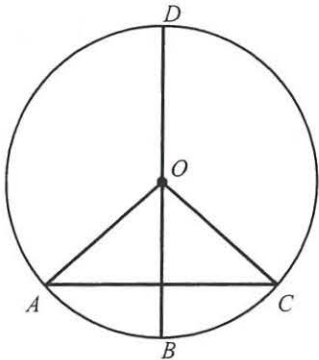
[C]



[D]



35. Identify a central angle.



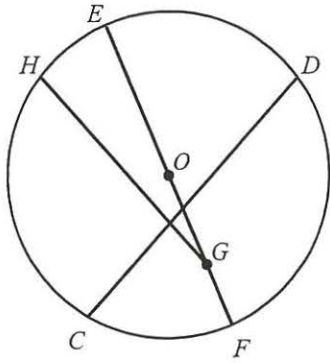
[A]  $\angle DOC$

[B]  $\angle ACO$

[C]  $\widehat{DC}$

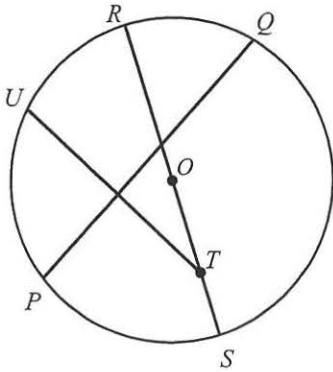
[D]  $\overline{OC}$

36. Identify two chords.



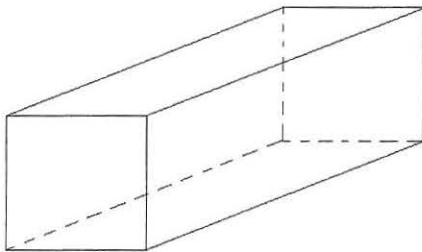
- [A]  $\overline{CD}$  and  $\overline{GH}$  [B]  $\overline{EF}$  and  $\overline{GH}$  [C]  $\overline{CD}$  and  $\overline{EF}$  [D]  $\overline{CO}$  and  $\overline{DO}$

37. Identify two chords.



- [A]  $\overline{PQ}$  and  $\overline{TU}$  [B]  $\overline{PO}$  and  $\overline{QO}$  [C]  $\overline{RS}$  and  $\overline{TU}$  [D]  $\overline{PQ}$  and  $\overline{RS}$

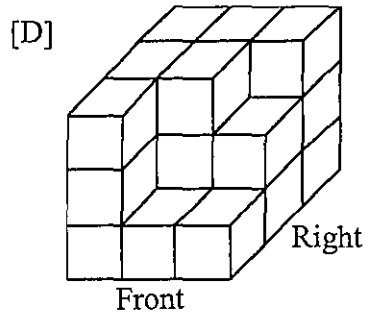
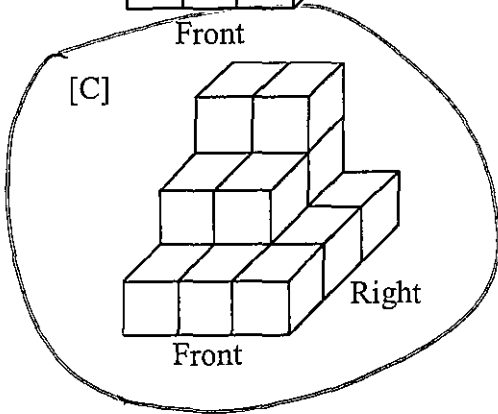
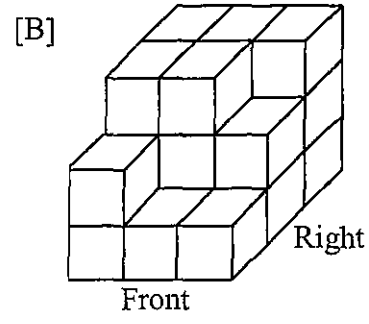
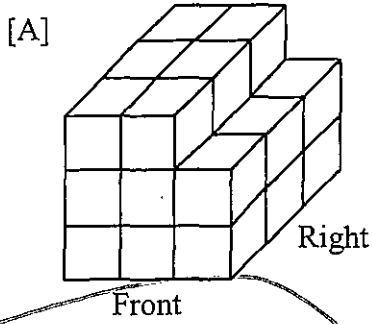
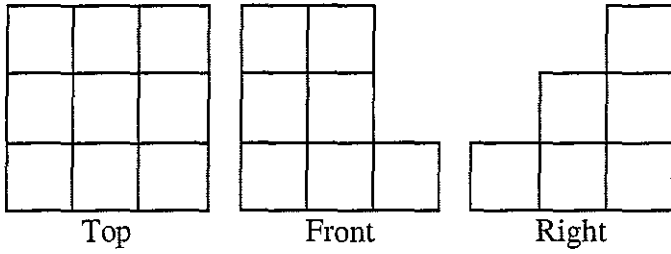
38. Can the rectangular prism below make a shadow in the shape of a circle?



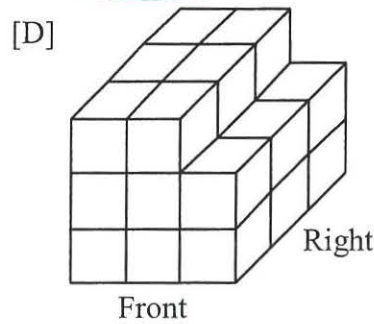
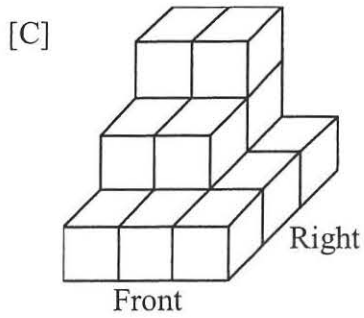
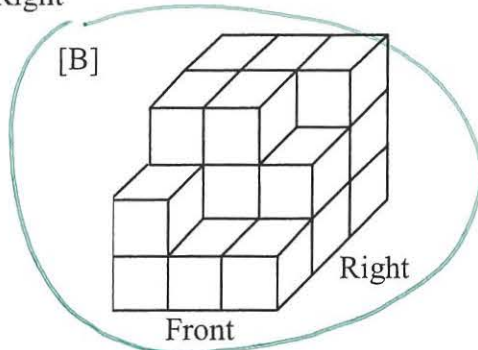
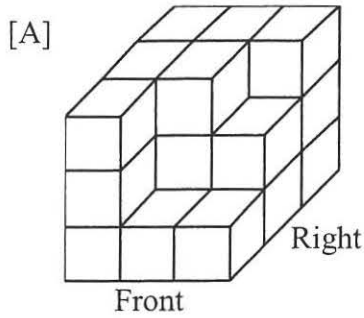
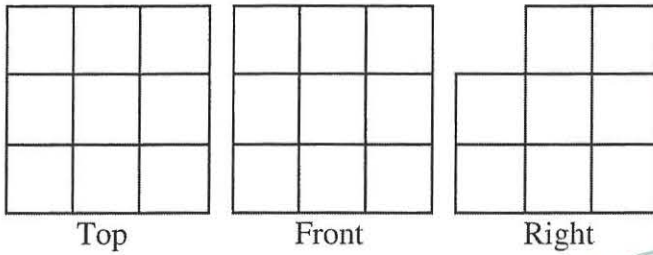
[A] Yes

[B] No

39. Which of the following shows a three-dimensional figure sketched from these views?

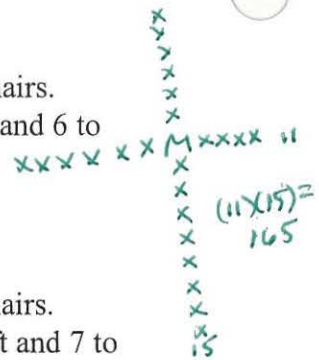


40. Which of the following shows a three-dimensional figure sketched from these views?



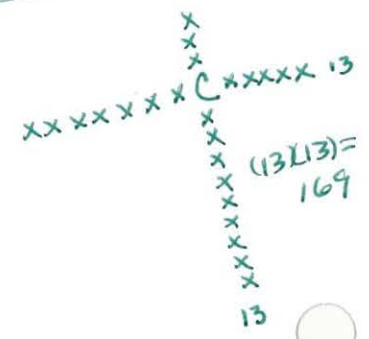
41. The chairs for a concert are arranged so that each row has the same number of chairs. Melissa has 8 seats in front of her, and 6 behind her. There are 4 seats to her left and 6 to her right. How many chairs are set up?

- [A] 169                      [B] 167                      [C] 165                      [D] 173

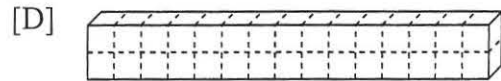
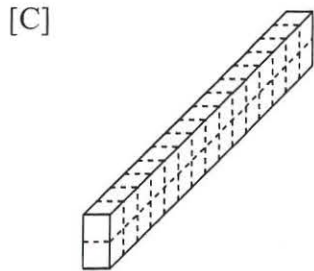
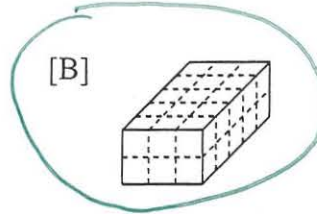
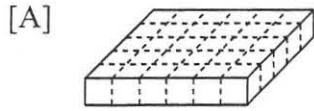
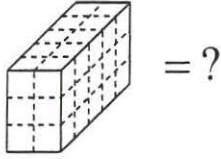


42. The chairs for a concert are arranged so that each row has the same number of chairs. Christina has 9 seats in front of her, and 3 behind her. There are 5 seats to her left and 7 to her right. How many chairs are set up?

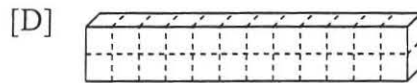
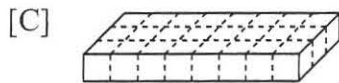
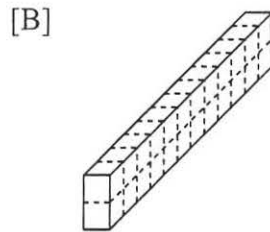
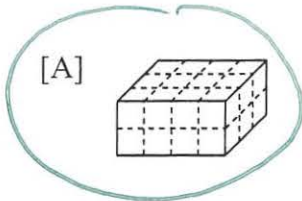
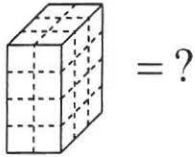
- [A] 174                      [B] 189                      [C] 173                      [D] 169



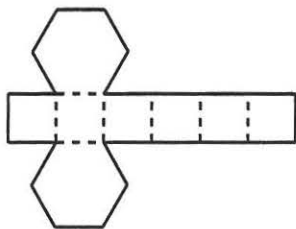
43. Identify the figure that models the associative property of multiplication.



44. Identify the figure that models the associative property of multiplication.

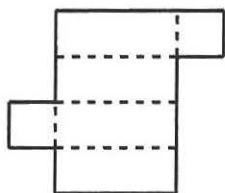


45. Which of the following solid figures does the net represent?



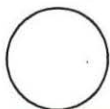
- [A] cylinder      [B] cone      [C] hexagonal prism      [D] hexagonal pyramid

46. Which of the following solid figures does the net represent?



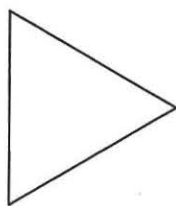
- [A] hexagonal pyramid      [B] rectangular pyramid  
[C] cylinder      [D] rectangular prism

47. Identify three solid figures that could have the cross section shown below.



- [A] sphere, cylinder, and cone      [B] pyramid, cube, rectangular prism  
[C] cylinder, triangular prism, cube      [D] cone, rectangular prism, pyramid

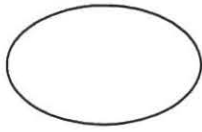
48. Which solid could have the following cross section when it is cut by a plane?



- [A] hemisphere      [B] sphere      [C] triangular pyramid      [D] cylinder



49. Which solid could have the following cross section when it is cut by a plane?



- [A] cube    [B] cone    [C] hexagonal prism    [D] sphere

50. Which is the best example of inductive reasoning?

- [A] A math student observes that the number 132 is divisible by the number 4. The student concludes that any even number is divisible by 4.
- [B] A student measures the angles of one square and finds they are all 90 degrees. The student concludes the angles in every square are 90 degrees.
- [C] A scientist observes during many tests, that a certain bacteria colony doubles in size within an hour. The scientist concludes that this bacteria colony will always double in size within an hour.
- [D] A scientist observes on Monday that it takes a certain material 2 hours to decompose. On Tuesday, the scientist observes the same material takes 3 hours to decompose, and on Wednesday it takes 2 hours to decompose. The scientist concludes that it will always take 2 hours for that type of material to decompose.

51. The two lists below give some examples of numbers which have a certain property and numbers which do not.

Do: 2, 6, 8, 12, 14, 16, 18, . . .

Do not: 1, 5, 9, 15, 19, 25, 33, . . .

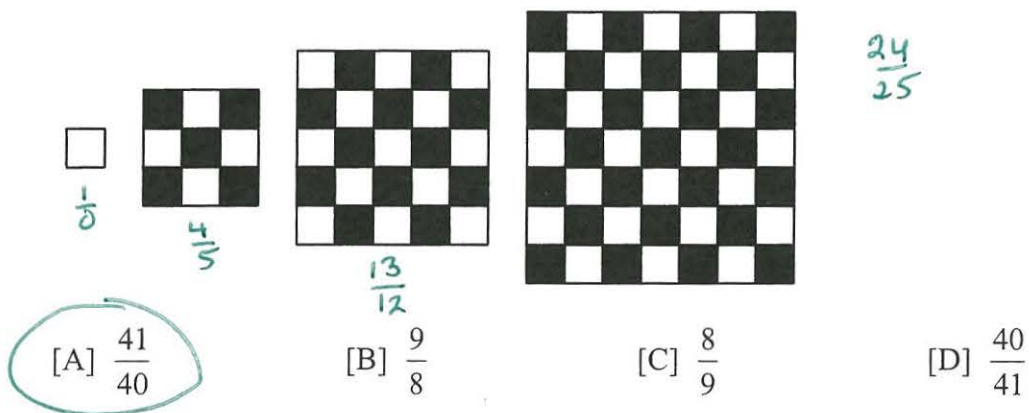
Which conjecture *could* be true about the numbers which do not have this property?

- [A] Numbers which do not have this property are odd.
- [B] Numbers which do not have this property are even.
- [C] Numbers which do not have this property are prime.
- [D] Numbers which do not have this property are not prime.

52. The two lists below give some examples of numbers which have a certain property and numbers which do not.  
 Do: 2, 3, 6, 10, 11, 13, 15, . . .  
 Do not: 1, 9, 16, 25, 36, 49, 81, . . .  
 Which conjecture *could* be true about the numbers which have this property?

- [A] Numbers which have this property are perfect squares.  
 [B] Numbers which have this property are not perfect squares.  
 [C] Numbers which have this property are not prime.  
 [D] Numbers which have this property are prime.

53. If the pattern were continued, what would be the ratio of the number of unshaded squares to the number of shaded squares in the next figure in the pattern?



54. When you use \_\_\_\_\_ reasoning you are generalizing from careful observation that something is probably true. When you use \_\_\_\_\_ reasoning you are establishing that, if a set of properties is accepted as true, something else must be true.

- [A] inductive; deductive      [B] deductive; deductive  
 [C] deductive; inductive      [D] inductive; inductive

55. Three girls are in three different rooms. Jane always tells the truth. Kim sometimes tells the truth. Naomi never tells the truth. Use the statements made by the person in each room to tell who is in each of the rooms.

Room 1 <i>Kim</i>	Room 2 <i>Naomi</i>	Room 3 <i>Jane</i>
The girl in Room 2 is Jane.	I'm Kim.	The girl in Room 2 is Naomi.

- [A] Room 1 - Jane; Room 2 - Naomi; Room 3 - Kim  
 [B] Room 1 - Kim; Room 2 - Naomi; Room 3 - Jane  
 [C] Room 1 - Kim; Room 2 - Jane; Room 3 - Naomi  
 [D] Room 1 - Naomi; Room 2 - Kim; Room 3 - Jane
56. Three boys are in three different rooms. Sam always tells the truth. Ralph sometimes tells the truth. Hiro never tells the truth. Use the statements made by the person in each room to tell who is in each of the rooms.

Room 1 <i>Hiro</i>	Room 2 <i>Sam</i>	Room 3 <i>Ralph</i>
I'm Ralph.	The guy in Room 1 is Hiro.	The guy in Room 1 is Sam.

- [A] Room 1 - Ralph; Room 2 - Hiro; Room 3 - Sam  
 [B] Room 1 - Hiro; Room 2 - Sam; Room 3 - Ralph  
 [C] Room 1 - Sam; Room 2 - Ralph; Room 3 - Hiro  
 [D] Room 1 - Ralph; Room 2 - Sam; Room 3 - Hiro
57. The definition of a parallelogram says, "If both pairs of opposite sides of a quadrilateral are parallel, then the quadrilateral is a parallelogram." Quadrilateral *LNDA* has both pairs of opposite sides parallel. What conclusion can you make? What type of reasoning did you use?
- [A] *LNDA* is a rectangle; deductive  
 [B] *LNDA* is a parallelogram; deductive  
 [C] *LNDA* is a rectangle; inductive  
 [D] *LNDA* is a parallelogram; inductive

58. Choose the correct rule for the sequence. Find the  $n$ th term in the sequence if you know its term number is  $n$ .

Term	1	2	3	4	5	...	$n$
Value	-4	-1	2	5	8	...	

$$3n - 7$$

- [A] Multiply the term number by  $-8$  and add  $4$ ;  $-8n + 4$   
 [B] Multiply the term number by  $-7$  and add  $3$ ;  $-7n + 3$   
 [C] Multiply the term number by  $4$  and subtract  $8$ ;  $4n - 8$   
 [D] Multiply the term number by  $3$  and subtract  $7$ ;  $3n - 7$

59. Choose the correct rule for the sequence. Find the  $n$ th term in the sequence if you know its term number is  $n$ .

Term	1	2	3	4	5	...	$n$
Value	-3	2	7	12	17	...	

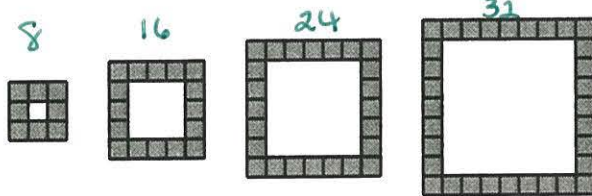
$$5n - 8$$

- [A] Multiply the term number by  $-9$  and add  $6$ ;  $-9n + 6$   
 [B] Multiply the term number by  $5$  and subtract  $8$ ;  $5n - 8$   
 [C] Multiply the term number by  $6$  and subtract  $9$ ;  $6n - 9$   
 [D] Multiply the term number by  $-8$  and add  $5$ ;  $-8n + 5$

60. a. Draw as many diagonals as possible from one vertex of a convex hexagon. How many triangles are created within the hexagon by those diagonals?  
 b. What is the formula for the number of triangles,  $t$ , created in a polygon by drawing as many diagonals as possible from one vertex, if  $n$  is the number of sides of the polygon?

- [A] a. 16 triangles  
 b.  $t = n + 10$   
 [B] a. 6 triangles  
 b.  $t = n$   
 [C] a. 2 triangles  
 b.  $t = \frac{n}{3}$   
 [D] a. 4 triangles  
 b.  $t = n - 2$

61. Find the rule for the  $n$ th figure. Then find the number of colored tiles in the 200th figure.



- [A]  $2n$ ; 400  
 [B]  $n + 8$ ; 208  
 [C]  $8n$ ; 1600  
 [D]  $n + 2$ ; 202

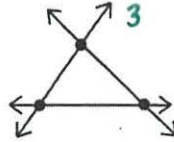
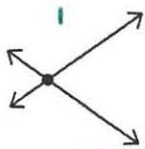
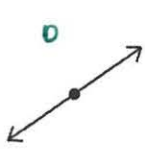
62. There are thirty-two teams in a soccer tournament. Each team plays until it loses 1 game. 32-1  
There are no ties. How many games are played?

[A] 15 games      [B] 16 games      [C] 31 games      [D] 32 games

63. There are sixteen teams in a soccer tournament. Each team plays until it loses 1 game. 16-1  
There are no ties. How many games are played?

[A] 7 games      [B] 16 games      [C] 8 games      [D] 15 games

64. If you draw 35 lines on a piece of paper so that no two lines are parallel to each other and no three lines are concurrent, how many times will they intersect?



$$\frac{n(n-1)}{2} = \frac{35 \times 34}{2} = 595$$

[A] 1190

[B] 595

[C] 18

[D] 35

65. The 12th grade class of 80 students is assembled in a large circle on the football field at half-time. Each student is connected by a string to each of the other class members. How many pieces of string are necessary to connect each student to all the others?

[A]  $\frac{80(81)}{2} = 3240$

[B]  $\frac{79(80)}{2} = 3160$

[C]  $\frac{(80)}{2} = 40$

[D]  $79(80) = 6320$

66. If a polygon has a total of 560 diagonals, how many vertices does it have?

[A]  $n(n-3) = 280$ ; there are 17 vertices

[B]  $\frac{n(n-3)}{2} = 280$ ; there are 17 vertices

[C]  $n(n-3) = 560$ ; there are 35 vertices

[D]  $\frac{n(n-3)}{2} = 560$ ; there are 35 vertices

67. If there are 20 people at a party and they shake hands with each other exactly once, how many handshakes are there in all?

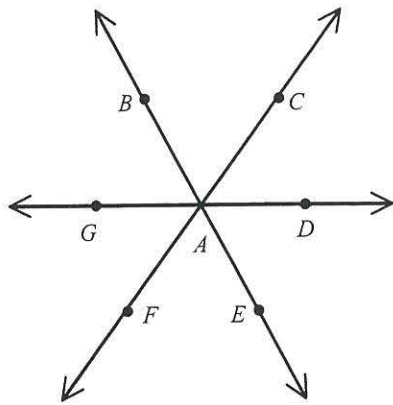
[A]  $n(n-1)$  yields 190 handshakes

[B]  $\frac{n(n-1)}{2}$  yields 380 handshakes

[C]  $\frac{n(n-1)}{2}$  yields 190 handshakes

[D]  $n(n-1)$  yields 380 handshakes

68. Which pair of angles are a linear pair?



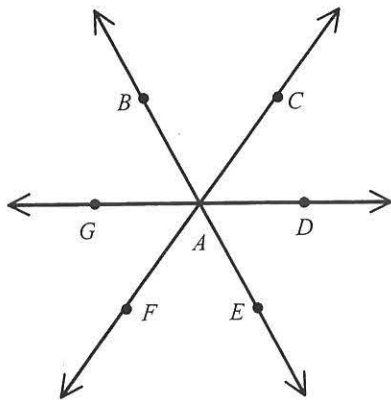
[A]  $\angle FAB$  and  $\angle BAC$

[C]  $\angle BAC$  and  $\angle FAE$

[B]  $\angle CAD$  and  $\angle GAF$

[D]  $\angle FAB$  and  $\angle GAE$

69. Which pair of angles are a linear pair?



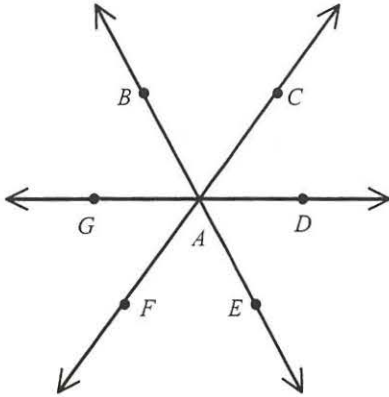
[A]  $\angle EAF$  and  $\angle FAB$

[C]  $\angle EAF$  and  $\angle CAD$

[B]  $\angle DAE$  and  $\angle EAF$

[D]  $\angle FAB$  and  $\angle FAD$

70. Which pair of angles are a vertical pair?



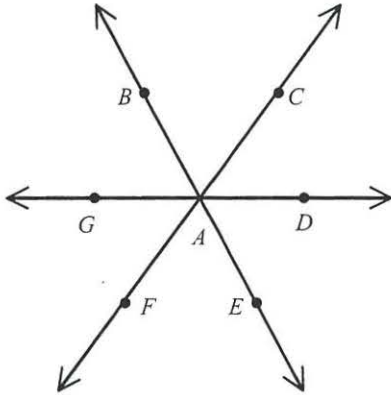
[A]  $\angle DAE$  and  $\angle EAF$

[C]  $\angle BAD$  and  $\angle GAE$

[B]  $\angle BAD$  and  $\angle DAE$

[D]  $\angle DAE$  and  $\angle DAE$

71. Which pair of angles are a vertical pair?



[A]  $\angle CAE$  and  $\angle CAE$

[C]  $\angle CAD$  and  $\angle DAE$

[B]  $\angle BAC$  and  $\angle CAE$

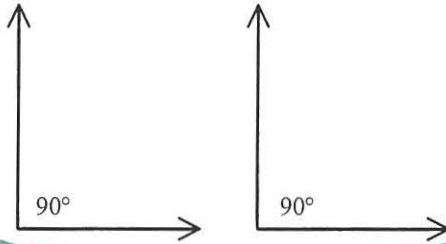
[D]  $\angle CAD$  and  $\angle GAF$

72. Determine the converse of the statement and whether it is true or false. If the converse is false determine the correct counterexample.

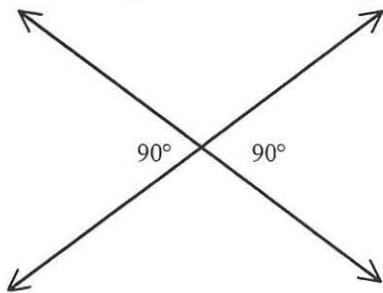
If two angles are vertical angles, then they have equal measures.

[A] If two angles do not have equal measures, then they are not vertical angles.; True

[B] If two angles have equal measures, then they are vertical angles.; False

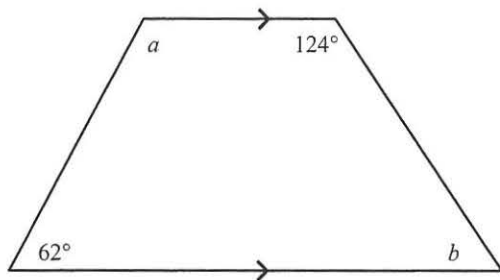


[C] If two angles are vertical angles, then they have equal measures.; False



[D] If two angles have equal measures, then they are vertical angles.; True

73. Find  $a$  and  $b$ .



$$a = 180 - 62 = 118$$

$$b = 180 - 124 = 56$$

[A]  $a = 62^\circ$ ,  $b = 34^\circ$

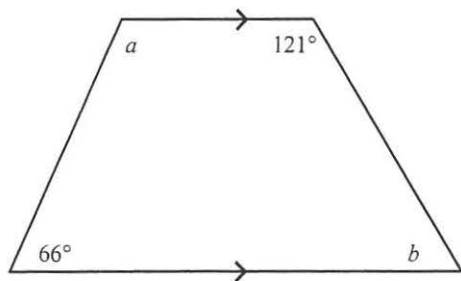
[B]  $a = 62^\circ$ ,  $b = 56^\circ$

[C]  $a = 118^\circ$ ,  $b = 56^\circ$

[D]  $a = 118^\circ$ ,  $b = 34^\circ$



74. Find  $a$  and  $b$ .



$$a = 180 - 66 = 114$$
$$b = 180 - 121 = 59$$

[A]  $a = 114^\circ, b = 59^\circ$

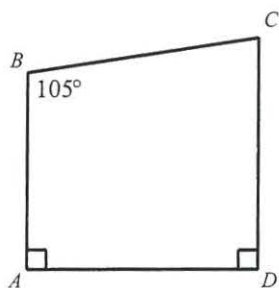
[C]  $a = 66^\circ, b = 31^\circ$

[B]  $a = 114^\circ, b = 31^\circ$

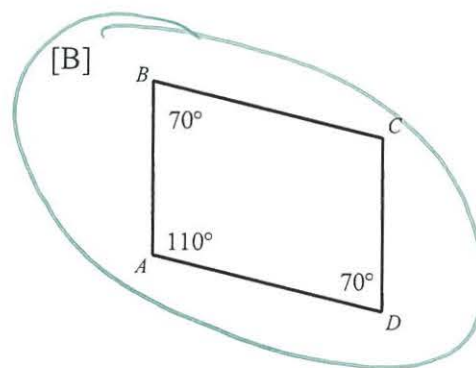
[D]  $a = 66^\circ, b = 59^\circ$

75. Which quadrilateral is a parallelogram?

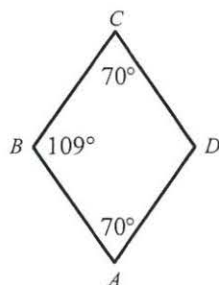
[A]



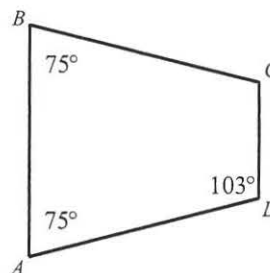
[B]



[C]

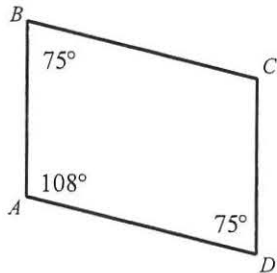


[D]

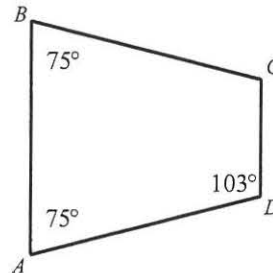


76. Which quadrilateral is a parallelogram?

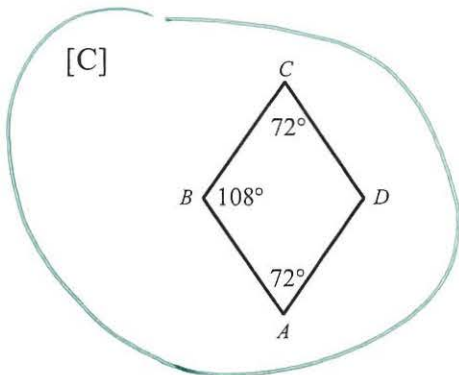
[A]



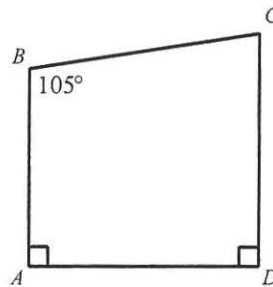
[B]



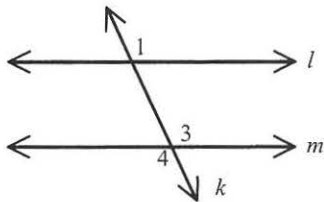
[C]



[D]



77. Choose the missing reasons of the paragraph proof.



Lines  $l$  and  $m$  are parallel and intersected by transversal  $k$ . Pick any two alternate exterior angles, such as  $\angle 1$  and  $\angle 4$ . According to the \_\_\_\_\_ Conjecture  $\angle 1 \cong \angle 4$ . And, according to the \_\_\_\_\_ Conjecture,  $\angle 4 \cong \angle 3$ . Substitute  $\angle 1$  for  $\angle 4$  in the statement to get  $\angle 1 \cong \angle 3$ . But  $\angle 1$  and  $\angle 3$  are corresponding angles. Therefore, if the alternate exterior angles are congruent, then the corresponding angles are congruent.

[A] Alternate Interior; Vertical Angles

[B] Corresponding Angles; Alternate Exterior

[C] Alternate Exterior; Vertical Angles

[D] Corresponding Angles; Vertical Angles

78. Which shows the slope of the line passing through the points  $A(-3, -3)$  and  $B(5, -6)$ ?

[A]  $-\frac{9}{2}$

[B] 0

[C]  $-\frac{3}{8}$

[D]  $-\frac{8}{3}$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-6 - (-3)}{5 - (-3)} = -\frac{3}{8}$$

79. Which shows the slope of the line passing through the points  $A(6, 5)$  and  $B(-2, 7)$ ?

[A]  $-4$

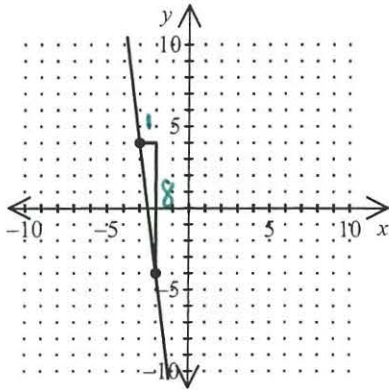
[B]  $-1$

[C]  $-\frac{1}{4}$

[D]  $3$

$$m = \frac{7-5}{-2-6} = \frac{2}{-8} = -\frac{1}{4}$$

80. Use slope triangles to calculate the slope of the graphed line.



$$m = -\frac{8}{1} = -8$$

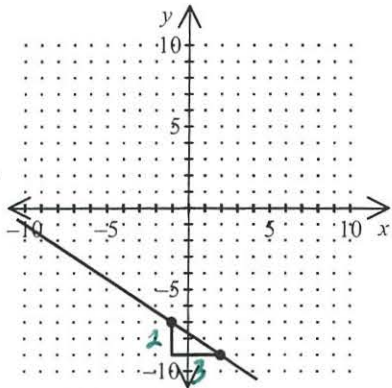
[A]  $8$

[B]  $\frac{1}{8}$

[C]  $-8$

[D]  $-\frac{1}{8}$

81. Use slope triangles to calculate the slope of the graphed line.



$$m = -\frac{2}{3}$$

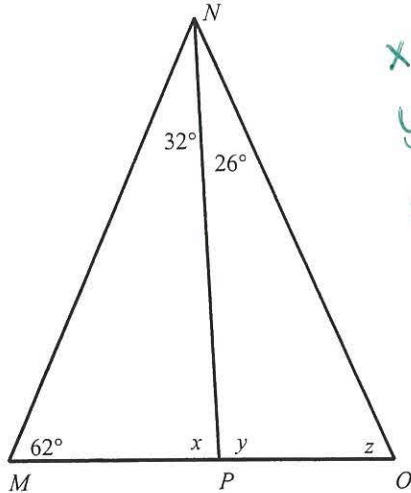
[A]  $-\frac{2}{3}$

[B]  $\frac{3}{2}$

[C]  $-\frac{3}{2}$

[D]  $\frac{2}{3}$

82. Find the values of  $x$ ,  $y$ , and  $z$ .



$$\begin{aligned} X: 62+32 &= 94 & 180-94 &= 86 \\ Y: 62+32 &= 94 \\ Z: 94+26 &= 120 & 180-120 &= 60 \end{aligned}$$

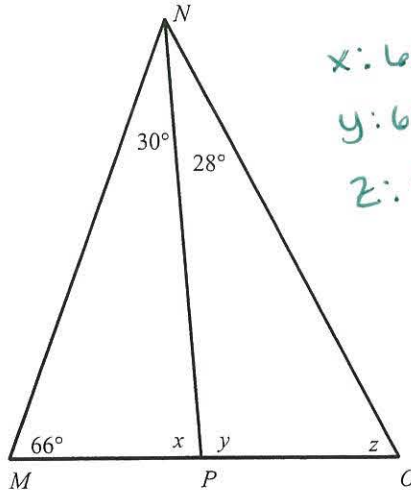
[A]  $x = 94^\circ$ ,  $y = 86^\circ$ ,  $z = 60^\circ$

[B]  $x = 94^\circ$ ,  $y = 86^\circ$ ,  $z = 58^\circ$

[C]  $x = 86^\circ$ ,  $y = 94^\circ$ ,  $z = 60^\circ$

[D]  $x = 86^\circ$ ,  $y = 94^\circ$ ,  $z = 58^\circ$

83. Find the values of  $x$ ,  $y$ , and  $z$ .



$$\begin{aligned} X: 66+30 &= 96 & 180-96 &= 84 \\ Y: 66+30 &= 96 \\ Z: 96+28 &= 124 & 180-124 &= 56 \end{aligned}$$

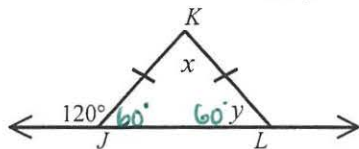
[A]  $x = 96^\circ$ ,  $y = 84^\circ$ ,  $z = 56^\circ$

[B]  $x = 84^\circ$ ,  $y = 96^\circ$ ,  $z = 58^\circ$

[C]  $x = 96^\circ$ ,  $y = 84^\circ$ ,  $z = 58^\circ$

[D]  $x = 84^\circ$ ,  $y = 96^\circ$ ,  $z = 56^\circ$

84. Find the values of  $x$  and  $y$ .



$$y = 180 - 120 = 60$$

$$x = 120 - 60 = 60$$

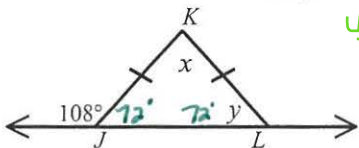
[A]  $x = 60^\circ; y = 80^\circ$

[B]  $x = 60^\circ; y = 40^\circ$

[C]  $x = 60^\circ; y = 120^\circ$

[D]  $x = 60^\circ; y = 60^\circ$

85. Find the values of  $x$  and  $y$ .



$$y = 180 - 108 = 72$$

$$x = 108 - 72 = 36$$

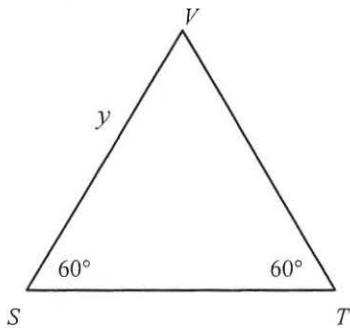
[A]  $x = 36^\circ; y = 108^\circ$

[B]  $x = 36^\circ; y = 72^\circ$

[C]  $x = 72^\circ; y = 52^\circ$

[D]  $x = 72^\circ; y = 108^\circ$

86. If the perimeter of  $\triangle STV$  is 18 yards, what is the value of  $y$ ?



$$\frac{18}{3} = 6$$

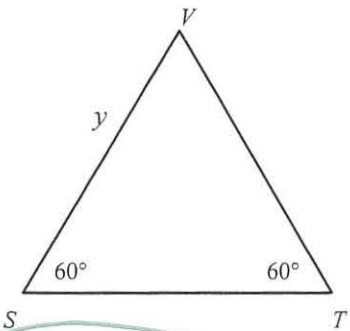
[A]  $y = 12$  yd

[B]  $y = 18$  yd

[C]  $y = 60$  yd

[D]  $y = 6$  yd

87. If the perimeter of  $\triangle STV$  is 30 yards, what is the value of  $y$ ?



$$\frac{30}{3} = 10$$

[A]  $y = 10$  yd

[B]  $y = 60$  yd

[C]  $y = 20$  yd

[D]  $y = 30$  yd

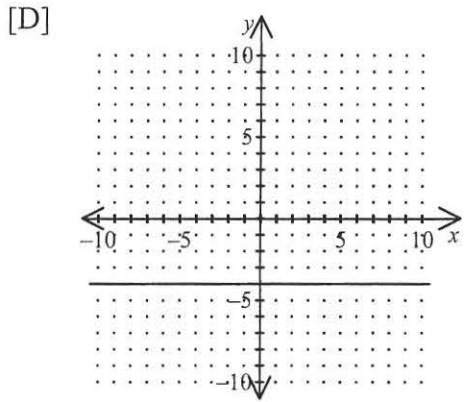
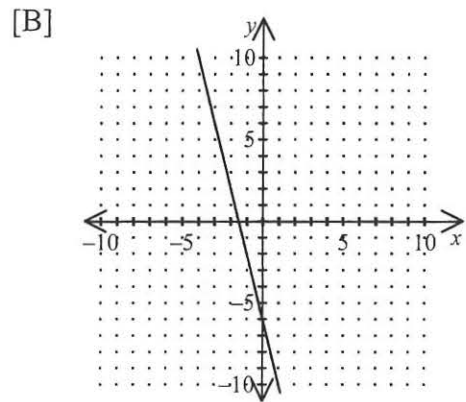
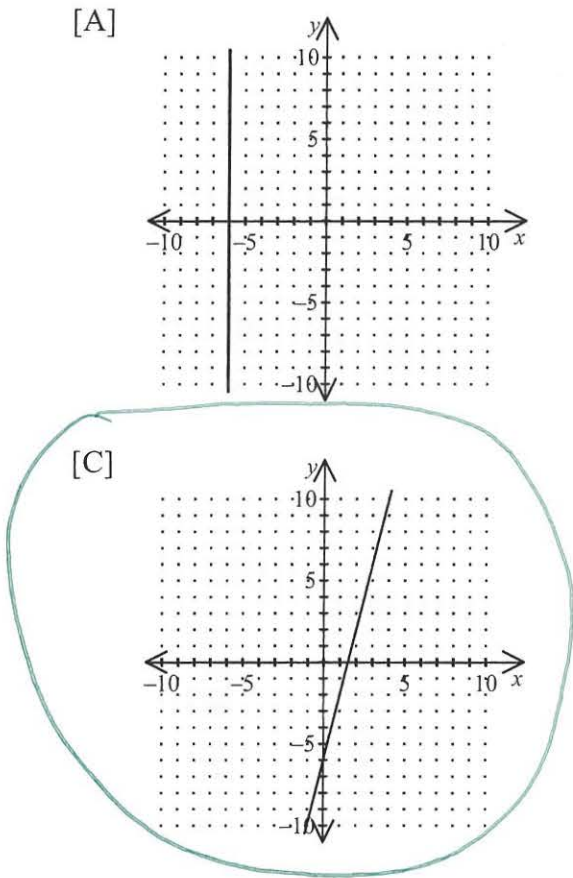
88. Find the slope-intercept form of the equation of the line with  $x$ -intercept  $-5$  and  $y$ -intercept  $-5$ .  
 [A]  $y = -x + 5$       [B]  $y = x - 5$       [C]  $y = -5x - 1$       [D]  $y = -x - 5$

$(-5, 0)$        $(0, -5)$   
 $m = \frac{-5 - 0}{0 - (-5)} = -1$

89. Find the slope-intercept form of the equation of the line with  $x$ -intercept  $-\frac{1}{4}$  and  $y$ -intercept  $-1$ .  
 [A]  $y = -x - 4$       [B]  $y = -4x - 1$       [C]  $y = -4x + 1$       [D]  $y = 4x - 1$

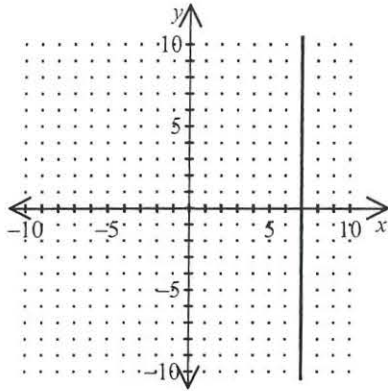
$(-\frac{1}{4}, 0)$        $(0, -1)$   
 $m = \frac{-1 - 0}{0 - (-\frac{1}{4})} = -4$

90. Which graph has a line with the same slope as the line given by the equation  $y = 4x - 6$ ?

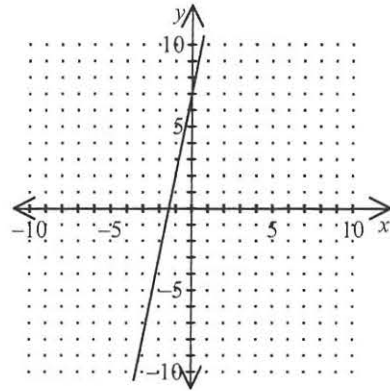


91. Which graph has a line with the same slope as the line given by the equation  $y = -5x + 7$ ?

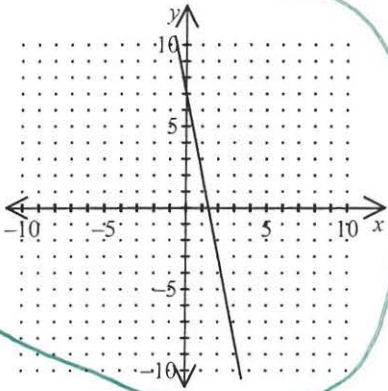
[A]



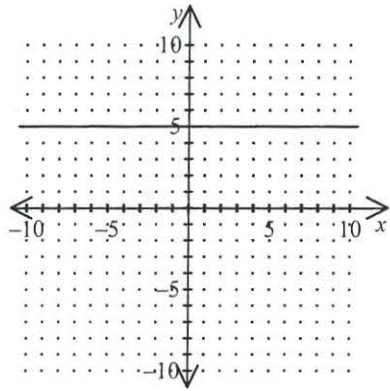
[B]



[C]



[D]



92. Find the  $x$ -intercepts of  $y = -\frac{1}{2}x - \frac{3}{2}$ .

[A]  $x$ -intercept =  $\frac{2}{3}$

[C]  $x$ -intercept =  $\frac{3}{2}$

[B]  $x$ -intercept =  $-3$

[D]  $x$ -intercept =  $-\frac{1}{3}$

$$0 = -\frac{1}{2}x - \frac{3}{2}$$

$$\frac{1}{2}x = -\frac{3}{2}$$

$$x = -3$$

93. Find the  $x$ -intercepts of  $y = -1x - \frac{5}{9}$ .

[A]  $x$ -intercept =  $\frac{9}{5}$

[C]  $x$ -intercept =  $-\frac{9}{5}$

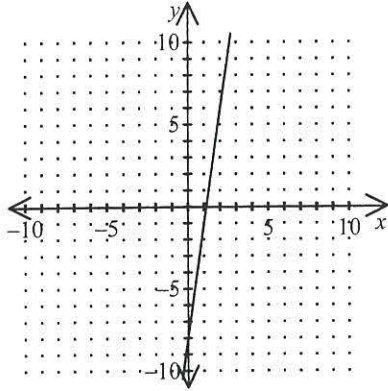
[B]  $x$ -intercept =  $-\frac{5}{9}$

[D]  $x$ -intercept =  $\frac{5}{9}$

$$0 = -1x - \frac{5}{9}$$

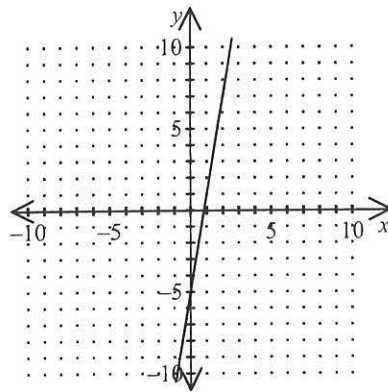
$$x = -\frac{5}{9}$$

94. Which equation could best represent the line in the graph below?



- [A]  $y = mx + b$  where  $m$  represents a negative slope and  $b \geq 0$ .
- [B]  $y = mx + b$  where  $m$  represents a positive slope and  $b \geq 0$ .
- [C]  $y = mx + b$  where  $m$  represents a negative slope and  $b \leq 0$ .
- [D]  $y = mx + b$  where  $m$  represents a positive slope and  $b \leq 0$ .

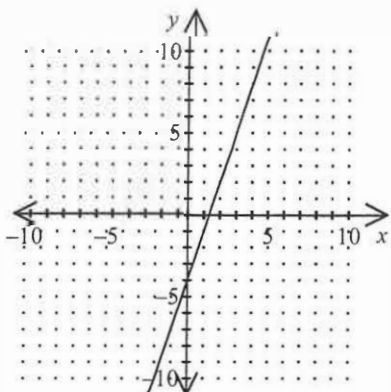
95. Which equation could best represent the line in the graph below?



- [A]  $y = mx + b$  where  $m$  represents a negative slope and  $b \leq 0$ .
- [B]  $y = mx + b$  where  $m$  represents a negative slope and  $b \geq 0$ .
- [C]  $y = mx + b$  where  $m$  represents a positive slope and  $b \leq 0$ .
- [D]  $y = mx + b$  where  $m$  represents a positive slope and  $b \geq 0$ .



96. Which equation best describes the graph below?



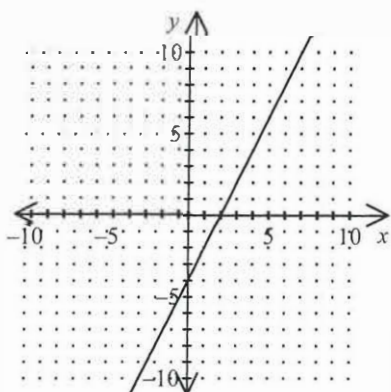
[A]  $y = 3x + \frac{4}{3}$

[B]  $y = 3x - 4$

[C]  $y = \frac{1}{3}x - 4$

[D]  $y = -\frac{1}{3}x - 4$

97. Which equation best describes the graph below?



[A]  $y = 2x - 4$

[B]  $y = 2x + 2$

[C]  $y = -2x + 4$

[D]  $y = \frac{1}{2}x - 4$

98. Determine which three lengths can be measures of the sides of a triangle.

[A] 4 cm, 12 cm, 18 cm  $16 < 18$

[B] 7 cm, 8 cm, 15 cm  $15 = 15$

[C] 8 cm, 8 cm, 15 cm  $16 > 15$

[D] 12 cm, 5 cm, 18 cm  $17 < 18$

99. Determine which three lengths can be measures of the sides of a triangle.

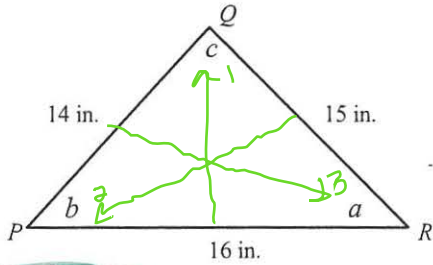
[A] 14 cm, 21 cm, 5 cm  $19 < 21$

[B] 7 cm, 14 cm, 7 cm  $14 = 14$

[C] 14 cm, 7 cm, 8 cm  $15 > 14$

[D] 21 cm, 14 cm, 6 cm  $20 < 21$

100. Arrange the unknown measures in order from greatest to least.



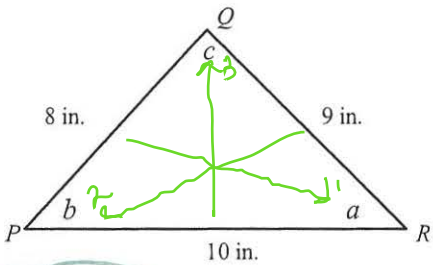
[A]  $c, b, a$

[B]  $c, a, b$

[C]  $b, c, a$

[D]  $b, a, c$

101. Arrange the unknown measures in order from least to greatest.



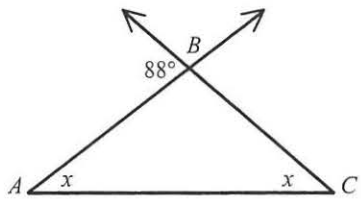
[A]  $a, b, c$

[B]  $a, c, b$

[C]  $c, b, a$

[D]  $c, a, b$

102. Find the value of  $x$ .



$$\frac{88}{2} = 44$$

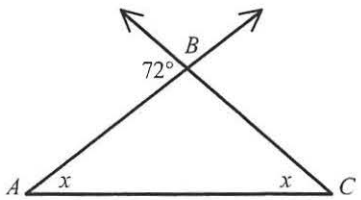
[A]  $92^\circ$

[B]  $176^\circ$

[C]  $44^\circ$

[D]  $88^\circ$

103. Find the value of  $x$ .



$$\frac{72}{2} = 36$$

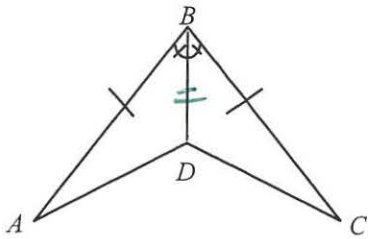
[A]  $144^\circ$

[B]  $72^\circ$

[C]  $108^\circ$

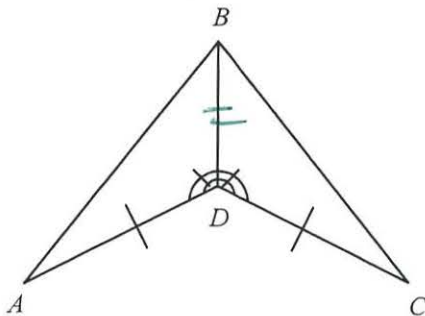
[D]  $36^\circ$

104. Use the markings on the diagram to determine why  $\triangle ADB \cong \triangle CDB$ . Choose the correct corresponding parts.



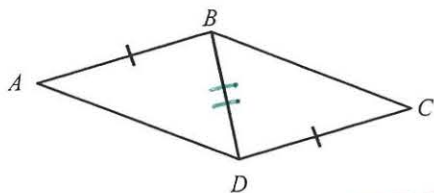
- [A] SSS,  $\angle A \cong \angle C$ ,  $\angle ABD \cong \angle CBD$ ,  $\angle ADB \cong \angle CDB$   
 [B] ASA,  $\angle A \cong \angle C$ ,  $\overline{AB} \cong \overline{CB}$ ,  $\overline{AD} \cong \overline{CD}$   
 [C] SAS,  $\angle A \cong \angle C$ ,  $\overline{AD} \cong \overline{CD}$ ,  $\angle BDA \cong \angle BDC$   
 [D] SSS,  $\angle A \cong \angle C$ ,  $\overline{AB} \cong \overline{CB}$ ,  $\angle ABD \cong \angle CBD$

105. Use the markings on the diagram to determine why  $\triangle ADB \cong \triangle CDB$ . Choose the correct corresponding parts.



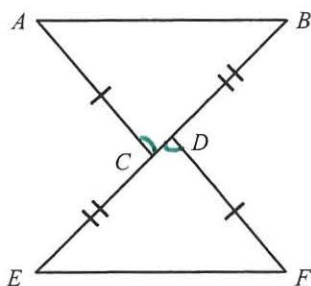
- [A] ASA,  $\angle A \cong \angle C$ ,  $\overline{AB} \cong \overline{CB}$ ,  $\overline{AD} \cong \overline{CD}$   
 [B] SSS,  $\angle A \cong \angle C$ ,  $\angle ABD \cong \angle CBD$ ,  $\angle ADB \cong \angle CDB$   
 [C] SAS,  $\angle A \cong \angle C$ ,  $\overline{AB} \cong \overline{CB}$ ,  $\angle ABD \cong \angle CBD$   
 [D] SSS,  $\angle A \cong \angle C$ ,  $\overline{AB} \cong \overline{CD}$ ,  $\angle BDA \cong \angle DBC$

106. Determine what information you would need to know in order to use the SSS Congruence Conjecture to show that the triangles are congruent.



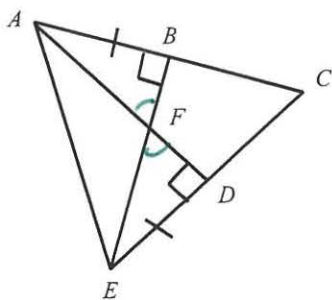
- [A]  $\angle BAD \cong \angle CDB$  [B]  $\overline{AD} \cong \overline{CB}$  [C]  $\angle ADB \cong \angle CBD$  [D]  $\overline{AD} \cong \overline{BD}$

107. Determine what information you would need to know in order to use the SAS Congruence Conjecture to show that the triangles are congruent.



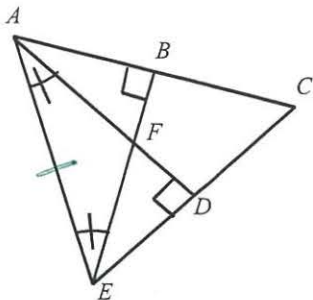
- [A]  $\overline{AB} \parallel \overline{FE}$  [B]  $\angle CAB \cong \angle DFE$  [C]  $\overline{AC} \parallel \overline{DF}$  [D]  $\angle CAB \cong \angle CEF$

108. Determine which triangles in the figure are congruent by SAA.



- [A]  $\triangle ADE \cong \triangle EBA$  [B]  $\triangle ABF \cong \triangle EDF$   
 [C]  $\triangle ABF \cong \triangle AFE$  [D]  $\triangle EFD \cong \triangle AFE$

109. Determine which triangles in the figure are congruent by SAA.



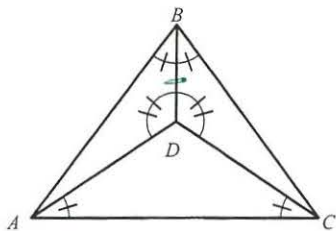
[A]  $\triangle AFE \cong \triangle EBC$

[B]  $\triangle ABF \cong \triangle EDF$

[C]  $\triangle ABE \cong \triangle EDA$

[D]  $\triangle CEB \cong \triangle AEB$

110. Determine which triangles in the figure are congruent by ASA.



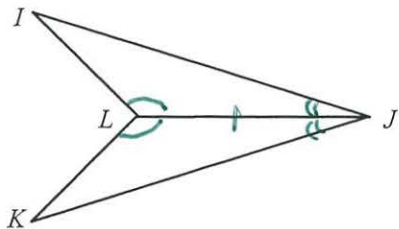
[A]  $\triangle ABC \cong \triangle ADC$

[B]  $\triangle CBD \cong \triangle ABC$

[C]  $\triangle ABD \cong \triangle ADC$

[D]  $\triangle ABD \cong \triangle CBD$

111. In the figure below,  $\overline{LJ}$  bisects  $\angle IJK$  and  $\angle ILJ \cong \angle JLK$ . Find a congruence statement for the two triangles in the figure and name the congruence shortcut used.



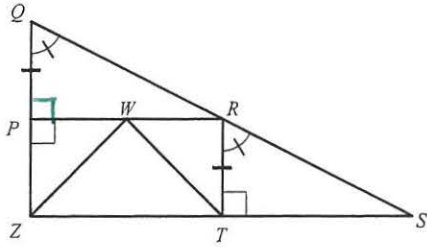
[A]  $\triangle KLJ \cong \triangle LIJ$ ; SAA

[B]  $\triangle ILJ \cong \triangle KLJ$ ; ASA

[C]  $\triangle KLJ \cong \triangle LIJ$ ; ASA

[D]  $\triangle ILJ \cong \triangle KLJ$ ; SAA

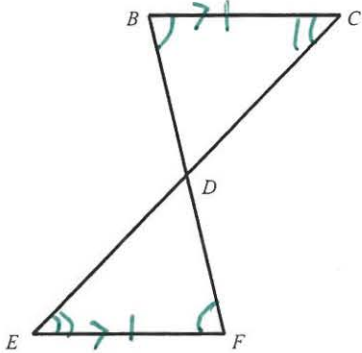
112. Refer to the figure below. Find a congruence statement for two triangles in the figure and name the congruence shortcut used.



- [A]  $\triangle WRT \cong \triangle WPZ$ ; SAA  
 [C]  $\triangle WRT \cong \triangle WPZ$ ; ASA

- [B]  $\triangle RPQ \cong \triangle STR$ ; ASA  
 [D]  $\triangle RPQ \cong \triangle STR$ ; SAA

113. Refer to the figure shown. Which of the following statements is true?  
 $\overline{BC} \parallel \overline{EF}$ ,  $BC = FE$



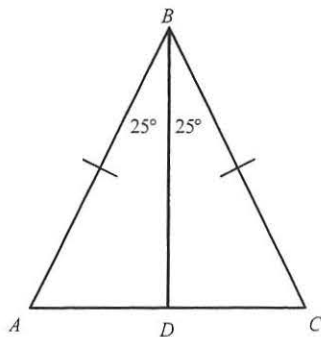
- [A]  $\triangle BCD \cong \triangle FED$  by ASA  
 [C]  $\triangle BCD \cong \triangle DFE$  by ASA

- [B]  $\triangle BCD \cong \triangle DFE$  by SAS  
 [D]  $\triangle BCD \cong \triangle FED$  by ASA

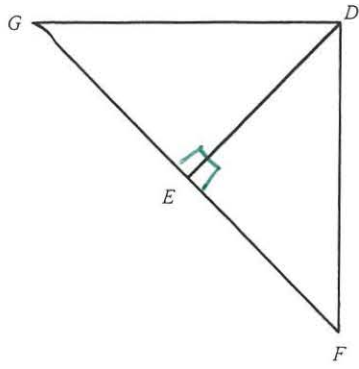
114. Can you show that  $\overline{BD}$  is a median of  $\triangle ABC$ ?

[A] Yes

[B] No

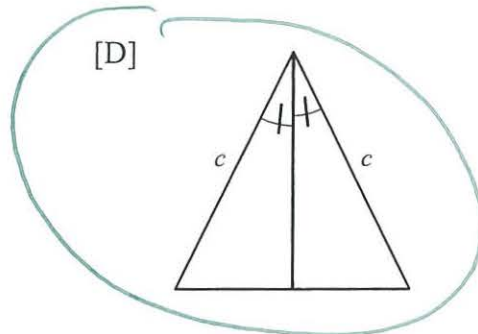
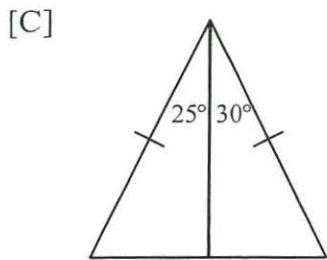
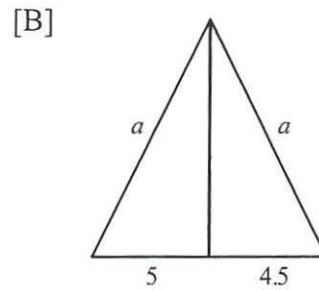
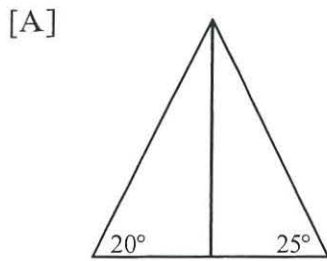


115.  $\overline{DE}$  is a median and altitude of  $\triangle GDF$ . What is the measure of angle  $DEF$ ?



- [A] 180 degrees    [B] 45 degrees    [C] 90 degrees    [D] 360 degrees

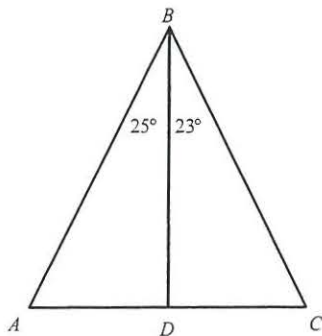
116. Which shows a median of a triangle?



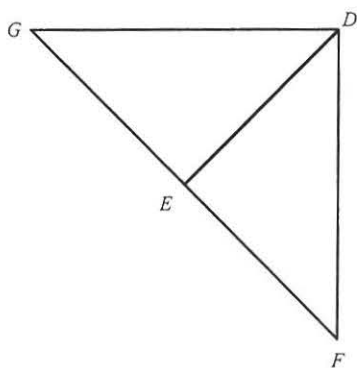
117. Can you show that  $\overline{BD}$  is an altitude of  $\triangle ABC$ ?

[A] Yes

[B] No



118.  $\overline{DE}$  is a median and altitude of  $\triangle GDF$ . Classify the triangle.



[A] scalene

[B] isosceles

[C] equilateral

[D] none of these

119. Which biconditional statement is true?

[A] Two angles are supplementary if and only if they form a linear pair.

[B] A ray bisects an angle if and only if it divides the angle into two congruent angles.

[C] Two lines are parallel if and only if they never intersect.

[D] A point is the midpoint of a segment if and only if it is between the endpoints of the segment.

120. Which biconditional statement is true?

[A] A point is the midpoint of a segment if and only if it is between the endpoints of the segment.

[B] Four points are non-coplanar if and only if they are non-collinear.

[C] Two lines are parallel if and only if they never intersect.

[D] Two angles form a linear pair if and only if their nonadjacent sides form a line.