

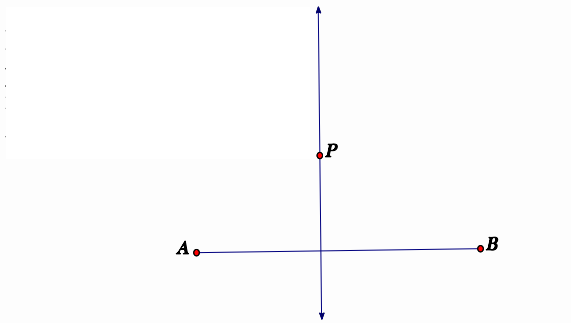
## Seattle Public Schools Review Questions for the Washington State Geometry End of Course Exam

- 1) Which term best defines the type of reasoning used below?

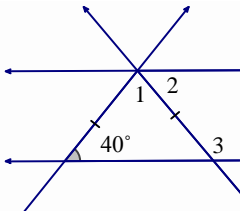
Abdul broke out in hives the last four times that he ate chocolate candy. Abdul concludes that he will break out in hives if he eats chocolate.

- a) Inductive
- b) Deductive
- c) Converse
- d) Inverse

- 2) Prove that any point P on the perpendicular bisector of AB is equidistant from both points A and B.



- 3) LJ and GH are parallel and  $m\angle L = 40^\circ$ .



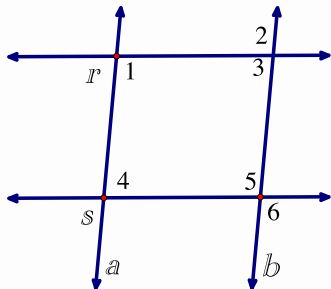
Find the measures of the numbered angles.

$m\angle 1 = \underline{\hspace{2cm}}$

$m\angle 2 = \underline{\hspace{2cm}}$

$m\angle 3 = \underline{\hspace{2cm}}$

- 4) In the figure below,  $m\text{ANGLE } 3 + m\text{ANGLE } 5 = 180 \text{ DEGREES}$ . Determine which lines are parallel. Justify your reasoning.



- 5) The given statement is a valid geometric proposition.

Statement: If a triangle has two congruent angles, then it is an isosceles triangle.

- a) Write the contrapositive of this statement:
  
- b) Determine if the contrapositive statement is valid. Explain your reasoning.

6) The given statement is a valid geometric proposition.

Statement: If a quadrilateral is a kite, then its diagonals are perpendicular.

Which of the following is the inverse statement?

- a) If a quadrilateral has diagonals that are perpendicular, then it is a kite.
- b) If a quadrilateral is not a kite, then its diagonals are not perpendicular.
- c) If a quadrilateral has diagonals that are not perpendicular, then it is not a kite.
- d) If a quadrilateral is a kite, then its diagonals are not perpendicular.

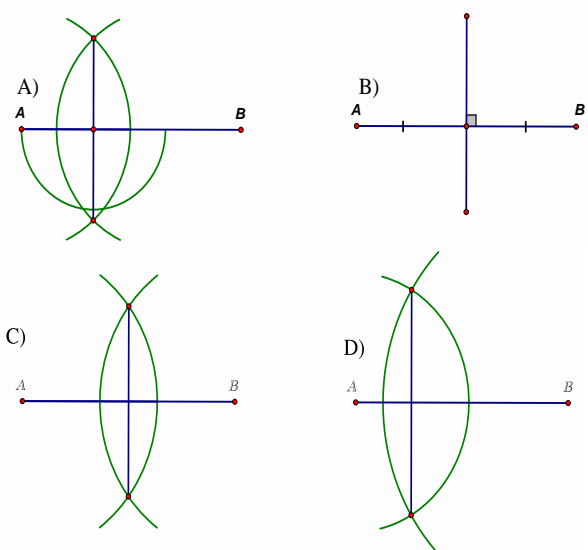
7) Given  $\angle ABC \cong \angle PRQ$ ,  $\overline{AB} \cong \overline{PQ}$ ,  $\overline{BC} \cong \overline{QR}$ , Elena said that  $\triangle ABC \cong \triangle PQR$  by SAS. Which of the following could be an error in her thinking?

- a) The triangles are  $\cong$  by ASA.
- b) The triangles are  $\cong$  by SSS.
- c)  $\angle PRQ$  is not between  $\overline{PQ}$  and  $\overline{RQ}$ .
- d)  $\triangle ABC$  is not an isosceles triangle.

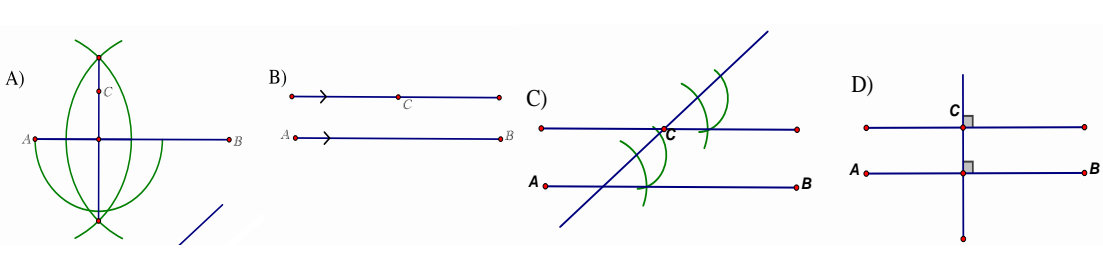
8) Which of the following kinds of statements cannot be used as a reason in a proof?

- a) Theorems
- b) Defined terms
- c) Postulates
- d) Assumptions

9) Which is the correct construction of a perpendicular bisector of AB?



10) Which is the correct construction of a line segment parallel to AB passing through point C?



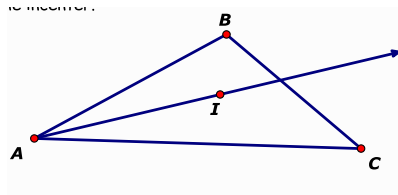
- 11) Complete the following statements.
- The ceiling and floor of your kitchen are examples of \_\_\_\_\_ planes.
  - A wall and the floor of your kitchen are examples of \_\_\_\_\_ planes.
- 12) Complete the following statement: Two lines that do not lie in the same plane are called \_\_\_\_\_ lines.
- Coplanar
  - Parallel
  - Skew
  - Perpendicular
- 13) Which construction represents the center of a circle that is inscribed in a triangle?
- The intersection of the three altitudes of the triangle.
  - The intersection of the three medians of the triangle.
  - The intersection of the angle bisectors of each angle of the triangle.
  - The intersection of the perpendicular bisectors of each side of the triangle.

- 14) In  $\triangle ABC$ , point  $I$  is the incenter.

$$m\angle BAI = \frac{1}{2}x + 4$$

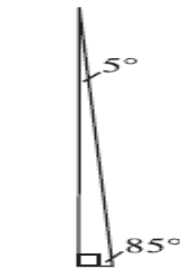
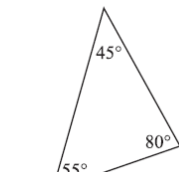
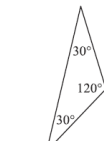
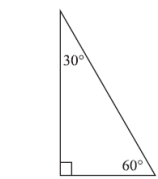
$$m\angle IAC = \frac{3}{4}x - 6$$

Find the value of  $x$ .

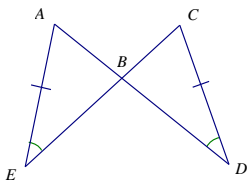


- 15)  $\triangle LPT$  is an obtuse scalene triangle. If  $\angle P$  is the obtuse angle in the triangle, which of the following is not a valid conclusion?
- $m\angle L + m\angle T < m\angle P$
  - $m\angle L + m\angle T < 90^\circ$
  - $m\angle L + m\angle T = 90^\circ$
  - $m\angle L + m\angle T + m\angle P = 180^\circ$

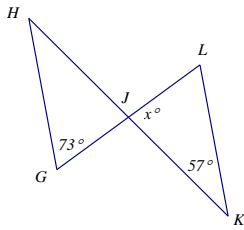
- 16) Which triangle has an altitude that is also a median?



- 17) In the diagram below,  $\angle E \cong \angle D$  and  $\overline{AE} \cong \overline{CD}$ . Prove  $\overline{AB} \cong \overline{CB}$  using mathematical language and concepts.

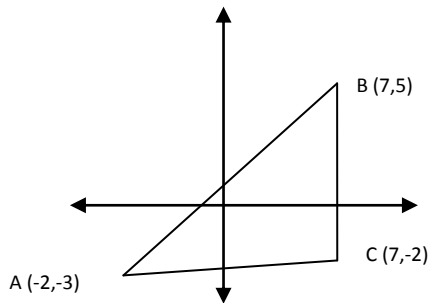


18) In the figure below,  $\overline{HK}$  and  $\overline{GL}$  bisect each other. Find the value of  $x$ . Justify your answer.



19) In the triangle below, how long is  $\overline{AC}$ ?

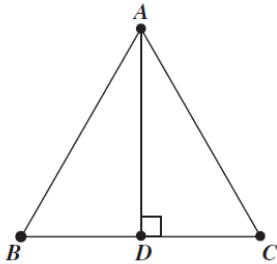
- a) 6
- b) 9.1
- c) 10
- d) 14.1



20) The hypotenuse of a  $45^\circ-45^\circ-90^\circ$  triangle measures 10 inches. What is the area of the triangle?

- a)  $25 \text{ in}^2$
- b)  $5\sqrt{2} \text{ in}^2$
- c)  $50 \text{ in}^2$
- d)  $10\sqrt{2} \text{ in}^2$

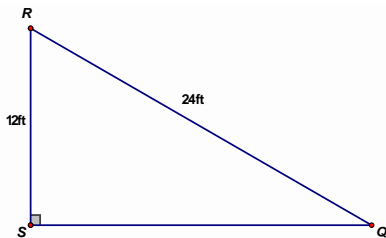
21) Triangle ABC is equilateral, with side lengths of 10 inches.



What is the length, in inches, of AD?

- a) 5
- b)  $\frac{10\sqrt{3}}{3}$
- c)  $5\sqrt{2}$
- d)  $5\sqrt{3}$

22) What is the  $m\angle R$ , to the nearest degree, in the figure below?



- a)  $60^\circ$
- b)  $36^\circ$
- c)  $30^\circ$
- d)  $27^\circ$

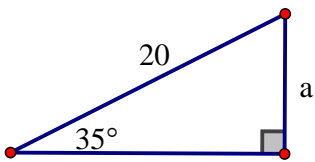
23)  $\triangle ABC$  has a right angle C.  $AC = 6 \text{ m}$ , and altitude  $\overline{CD}$  from  $\angle C$  to  $\overline{AB}$  is 5 m. Find the measure of  $\overline{AD}$ .

24) At a distance of 20 m from a building, a person who is 3 m tall looks up at an angle of  $25^\circ$  to see the top of the building. How tall is the building to the nearest meter?

- a) 8 m
- b) 9 m
- c) 12 m
- d) 18 m

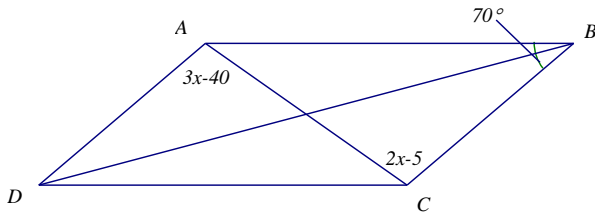
25) Find the length of the hypotenuse, to the nearest tenth of a centimeter, of a right triangle if one angle measures  $70^\circ$  and the adjacent leg measures 8 cm.

26) Find the value of  $a$  in the figure below, to the nearest whole number.

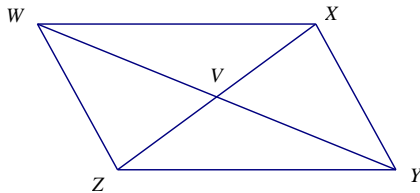


- a) 10
- b) 11
- c) 14
- d) 16

27) In the parallelogram below,  $m \angle ABC = 70^\circ$ . Find  $m \angle ACD$ .



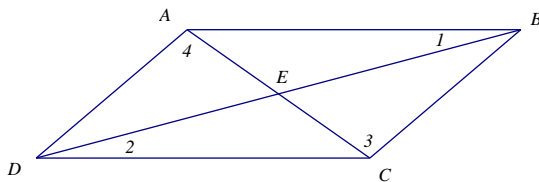
28) In the parallelogram below,  $WV = 5x + 2$  and  $YV = -x + 20$ . Find  $WY$ .



- a) 17
- b) 20
- c) 34
- d) 50

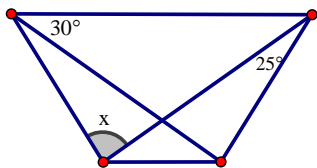
29) Complete the proof of the following statement: If the diagonals of a quadrilateral bisect each other, then the quadrilateral is a parallelogram.

Given: AC and BD bisect each other.  
 Prove: ABCD is a parallelogram.

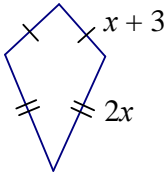


- |   |   |
|---|---|
| 1) AC and BD bisect each other.   | 1) Given  |
| 2) $\overline{AE} \cong \overline{CE}$<br>$\overline{BE} \cong \overline{DE}$         | 2) Definition of Bisect                                     |
| 3) $\angle BEC \cong \angle DEA$<br>$\angle BEA \cong \angle DEC$                     | 3) _____  |
| 4) $\triangle BEC \cong \triangle DEA$<br>$\triangle BEA \cong \triangle DEC$         | 4) _____  |
| 5) $\angle 1 \cong \angle 2$<br>$\angle 3 \cong \angle 4$                             | 5) _____  |
| 6) $\overline{AB} \parallel \overline{CD}$<br>$\overline{AD} \parallel \overline{BC}$ | 6) Alternate Interior Angles<br>with Parallel Lines Theorem |
| 7) _____  | 7) Definition of Parallelogram                              |

30) ABCD is an isosceles trapezoid. Find the value of  $x$ .



31) The perimeter of the figure below is 48. Find the value of  $x$ .



32) Tangents  $\overline{PA}$  and  $\overline{PB}$  are drawn to circle O from external point P, and radii  $\overline{OA}$  and  $\overline{OB}$  are drawn. If  $m\angle APB = 40^\circ$ , what is the measure of  $\angle AOB$ ?

- a)  $50^\circ$
- b)  $70^\circ$
- c)  $140^\circ$
- d)  $160^\circ$

33) A trapezoidal prism has \_\_\_\_ total faces.

- a) 4
- b) 5
- c) 6
- d) 7

34) If a plane intersects a cube, the intersection of the plane and cube cannot be a(an) \_\_\_\_\_.

- a) Triangle
- b) Square
- c) Rectangle
- d) Octagon

35)  $\overline{AC}$  starts at point A (1,4), and ends at point C (7, 13). What are the coordinates of the midpoint of  $\overline{AC}$ ?

36) Given points A (0, -3), B (5, 3), Q (-3, -1), which of the following points is a location of P so that  $\overline{PQ}$  is parallel to  $\overline{AB}$ ?

- a) (0,3)
- b) (12,5)
- c) (-7,11)
- d) (2,5)

37) Write an equation for a circle with a radius of 2 units, centered at (1,3).

38) The center of a circle is at (3, -1). One point on the circle is at (6,2). Write the equation of the circle.

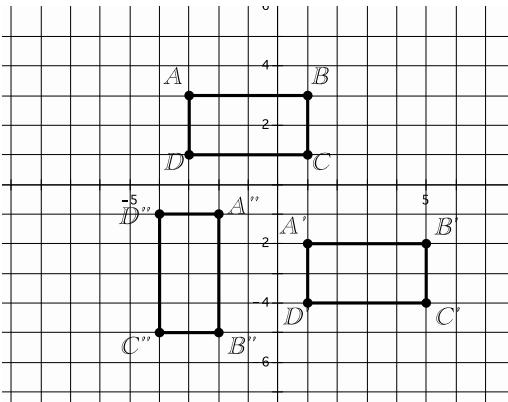
39) The point (-2,-8) is reflected over the line  $y = -1$ . What are the coordinates of P'?

- a) (-2,8)
- b) (2,8)
- c) (2,-9)
- d) (-2,6)

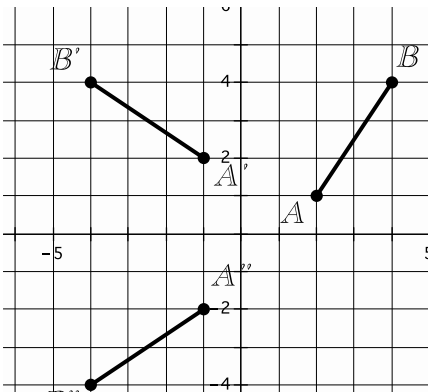
40) Suppose triangle ABC has vertices A (-5,-2), B (-6,-2), and C (-6,-6). If triangle ABC is rotated  $90^\circ$  counterclockwise about the origin, what are the coordinates of the vertices of triangle A'B'C'?

- a) A' (2,-5), B' (2, -6), C' (6, -6)
- b) A' (-5,2), B' (-6,2), C' (-6,6)
- c) A' (5,-2), B' (6,-2), C' (-6,-6)
- d) A' (2,-5), B' (-2,-6), C' (-6,-6)

41) Describe the composition of transformations  $ABCD$  to  $A'B'C'D'$  to  $A''B''C''D''$  in the diagram below.

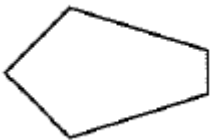


42) Which answer choice shows, in the correct order, the transformations needed to obtain  $\overline{A''B''}$ ?



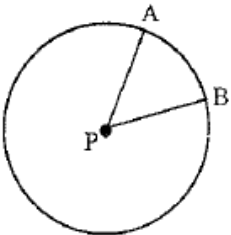
- a) A rotation and a translation
- b) A reflection and a rotation
- c) A translation and a reflection
- d) A rotation and a reflection

43) How many lines of symmetry does the polygon shown have?



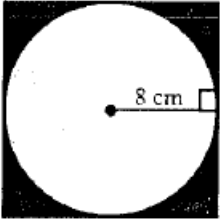
- a) 0
- b) 1
- c) 2
- d) 3

44) Find the area of the sector in circle P if  $PA = 10$  and  $m\angle APB = 36^\circ$ .

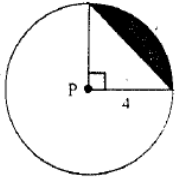


- a)  $10\pi$
- b)  $20\pi$
- c)  $36\pi$
- d)  $72\pi$

45) Find the area of the shaded region. Show your work in the box and write your answer on the line.

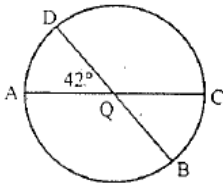


46) In circle P, find the area of the shaded region. Use an approximate value of 3.14 for  $\pi$ .



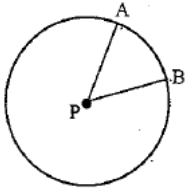
- a) 3.14 square units
- b) 4.56 square units
- c) 6.28 square units
- d) 9.62 square units

47) In circle Q, find the measure of arc ADB.



- a)  $42^\circ$
- b)  $138^\circ$
- c)  $222^\circ$
- d)  $318^\circ$

48) In circle P, find the length of arc AB if  $PA = 10$  and  $m\angle APB = 36^\circ$ .



- a)  $2\pi$
- b)  $0.556\pi$
- c)  $10\pi$
- d)  $12\pi$

49) The area of a sector of a circle is  $54\pi\text{ cm}^2$ . If the central angle is  $60^\circ$ , what is the radius of the circle? Show your work in the box and write your answer on the line.

50) Two cylinders have the same height. Their radii are 6 cm and 3 cm. What is the ratio of the volume of the cylinder with radius 6 cm to the volume of the cylinder with radius 3 cm? Show your work in the box and write your answer on the line.

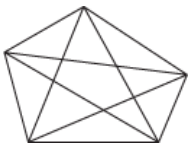
51) If the volume of a cone is  $96\pi\text{ cm}^3$  and the base of the cone has a radius of 6 cm, find the height of the cone.

- a) 2.55 cm
- b) 8 cm
- c) 16 cm
- d) 48 cm



- 52) Donna wants to put a ceramic castle whose volume is  $350 \text{ cm}^3$  and a plastic scuba diver whose volume is  $250 \text{ cm}^3$  in her aquarium as decoration. Her aquarium measures  $40 \text{ cm} \times 30 \text{ cm} \times 30 \text{ cm}$  high. The water is  $2 \text{ cm}$  from the top before she begins to decorate. How much will the water rise when she puts the castle and the diver in?
- a)  $0.5 \text{ cm}$   
 b)  $1 \text{ cm}$   
 c)  $2 \text{ cm}$   
 d)  $6 \text{ cm}$
- 53) Cube A has side lengths that are two times as long as the sides of cube B. How many times larger is cube A's volume than that of cube B?
- a) 2  
 b) 4  
 c) 6  
 d) 8
- 54) A golden rectangle has a length and width in the golden ratio  $\frac{1+\sqrt{5}}{2}$ . Give a decimal approximation for the golden ratio that is accurate to six decimal places.
- a) 2.118033  
 b) 1.618034  
 c) 2.581138  
 d) 2.581139
- 55) A digital camera takes pictures that are 3.2 megabytes in size. If the pictures are stored on a 1-gigabyte card, how many pictures can be taken before the card is full? (There are 1000 megabytes in a gigabyte.) Show your work in the box and write your answer on the line.
- 56) One line divides a plane into two parts. Two distinct parallel lines divide a plane into three parts. Into how many parts will  $n$  distinct parallel lines divide a plane?
- a)  $n$   
 b)  $n + 1$   
 c)  $n - 1$   
 d)  $2n - 1$

- 57) A pentagon has five diagonals, as shown. The chart below shows the relationship between the number of sides of a polygon and the number of diagonals in a polygon.



Number of Sides	3	4	5	6	7	8	9	10
Number of Diagonals	0	2	5	9	14	20	?	?

Based on this pattern, how many diagonals can be drawn in a 10-sided polygon?

- a) 25  
 b) 27  
 c) 30  
 d) 35

58) Two complementary angles have measures of  $s$  and  $t$ . If  $t$  is 9 less than twice  $s$ , which system of linear equations can be used to determine the measure of each angle?

- a)  $t + s = -9$   
 $t = 2s - 90$
- b)  $t - s = -9$   
 $t = 2s + 90$
- c)  $t + s = 90$   
 $t = 2s - 9$
- d)  $t + s = 90$   
 $t = -2s - 9$

59) Consider these statements:

- Every square is a rhombus.  
Quadrilateral ABCD is not a rhombus.

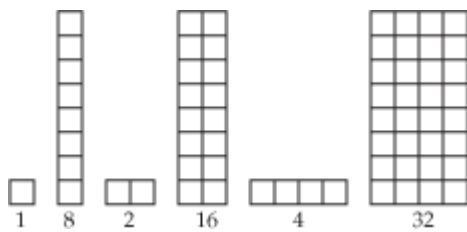
Which of these conclusions can be made using both statements?

- a) ABCD is not a parallelogram.  
b) ABCD is a rectangle.  
c) ABCD is not a square.  
d) ABCD is a trapezoid.

60) Melanie, Nikki, and Donny are three students in a geometry class. Melanie is younger than Nikki, and Donny is older than Nikki. Which of these must be true?

- a) Donny is the youngest of the three students.  
b) Melanie is the youngest of the three students.  
c) Nikki is the oldest of the three students.  
d) Melanie is the oldest of the three students.

61) If the pattern shown below continues, how many squares will be in the next figure?



- a) 6  
b) 8  
c) 16  
d) 64

62) Look at the pattern below.

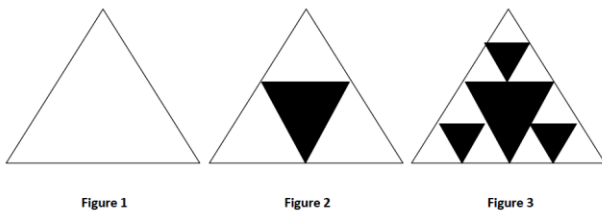
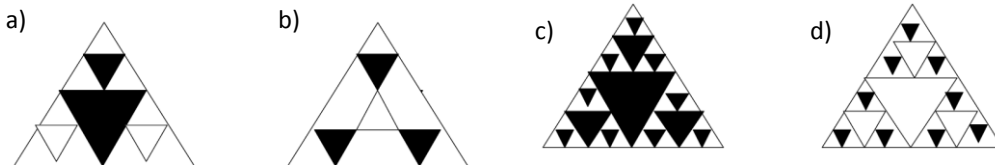


Figure 1

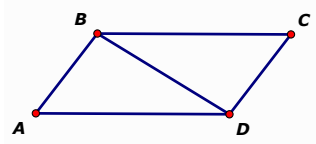
Figure 2

Figure 3

If the pattern continues, which of these would be next in the pattern?

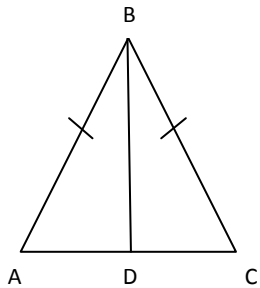


63) In the figure below,  $\triangle ABD$  and  $\triangle CDB$  are isosceles triangles. The vertex angles,  $\angle ADB$  and  $\angle CBD$ , are congruent.

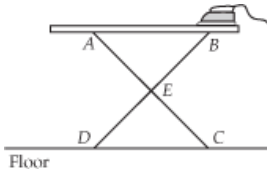


Prove that quadrilateral ABCD is a parallelogram.

64) Isosceles triangle ABC is shown below. BD is an angle bisector of  $\angle ABC$ . Prove that  $\overline{BD}$  bisects  $\overline{AC}$ .



65) The legs of an ironing board are congruent and bisect each other.



- Prove that the ironing board is parallel to the floor.
- Use mathematics to justify that ABCD is a rectangle.

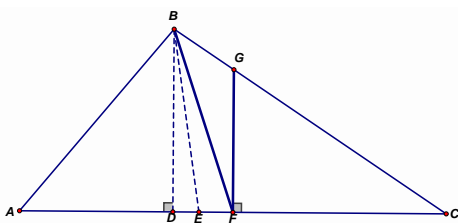
66) The two statements below are true.

- All simkos are temas.
- All bollies are simkos.

Using deductive reasoning, which of these statements must also be true?

- All temas are bollies.
- All simkos are bollies.
- All temas are simkos.
- All bollies are temas.

67) Given:  $\overline{AF} \cong \overline{FC}$



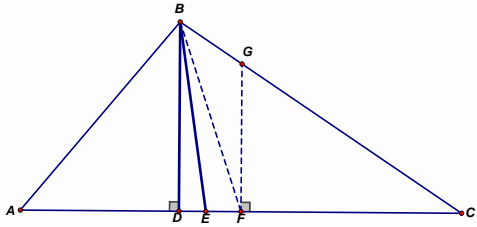
Use the word bank below the triangle to name each special segment in  $\triangle ABC$ .

**Word Bank:** Median, Angle Bisector, Perpendicular Bisector, Altitude

$\overline{BF}$ :

$\overline{FG}$ :

68) Given:  $\angle ABE \cong \angle EBC$ . Use the word bank below the triangle to name each special segment in  $\triangle ABC$ .



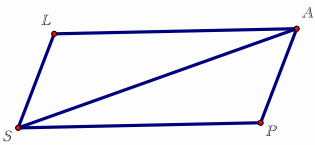
**Word Bank:** Median, Angle Bisector, Perpendicular Bisector, Altitude

$\overline{BD}$ :

$\overline{EB}$ :

69) Jennifer has created a two-column proof as a response to the following question. Evaluate her argument to determine if you support or contradict her conclusion.

Given:  $\overline{LA} \cong \overline{PS}$ ,  $\overline{LS} \cong \overline{PA}$       Prove:  $\overline{LA} \parallel \overline{PS}$



**Statement**

- 1)  $\overline{LA} \cong \overline{PS}$
- 2)  $\overline{SL} \cong \overline{AP}$
- 3)  $\overline{SA} \cong \overline{AS}$
- 4)  $\triangle LAS \cong \triangle PSA$
- 5)  $\angle PSA \cong \angle LSA$
- 6) Prove:  $\overline{LA} \parallel \overline{PS}$

**Reason**

- 1) Given
- 2) Given
- 3) Same Segment/Reflexive
- 4) SSS
- 5) Corresponding Parts of Congruent Triangles are Congruent
- 6) Alternate Interior Angles

Determine if Jennifer's argument is valid. Explain your reasoning. Support your answer with evidence from the diagram or Jennifer's proof.