

Ch 2 - 2D Geometry

True/False

Indicate whether the sentence or statement is true or false.

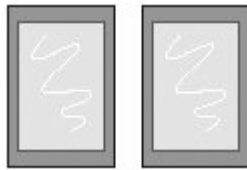
If false, write the corrected statement in the space provided.

_____ 1. A right triangle can be similar to an obtuse triangle.

_____ 2. A rhombus CANNOT be a parallelogram.

_____ 3. Two squares that have the same perimeter must be congruent.

_____ 4. These two shapes are similar but not congruent.

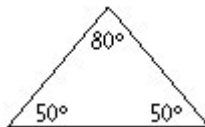


_____ 5. Two figures that are similar are congruent.

Multiple Choice

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

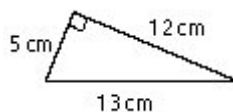
_____ 6. Classify the following triangle by the measurement of the angles.



- a. acute triangle
- b. right triangle

- c. obtuse triangle
- d. isosceles

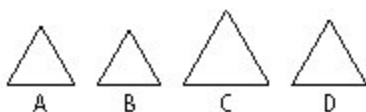
_____ 7. Classify the following triangle in two ways.



- a. right, scalene triangle
- b. right, isosceles triangle

- c. acute, isosceles triangle
- d. obtuse, scalene triangle

- ___ 8. I have four equal sides but no right angles. What quadrilateral am I?
 a. rhombus c. kite
 b. square d. rectangle
- ___ 9. I have two pairs of opposite sides that are parallel. I have no right angles. All of my sides are of equal length. What type of quadrilateral am I?
 a. kite c. parallelogram
 b. rhombus d. square
- ___ 10. Which of the following shapes are congruent?



- a. A and B c. B and C
 b. C and D d. A and D

Completion

Complete each sentence or statement.

11. A(n) _____ angle measures more than 90° but less than 180° .
 12. A(n) _____ angle measures less than 90° .
 13. Stella and Christina each constructs a triangle that measures 3.5 cm, 5.0 cm, and 5.5 cm. These two triangles are _____ triangles.

Matching

Match the correct term to each of the following descriptions.

- | | |
|----------|--------------------|
| a. ray | e. vertex |
| b. flip | f. protractor |
| c. slide | g. line segment |
| d. turn | h. transformations |

- ___ 14. another name for a rotation
 ___ 15. Another name for a reflection
 ___ 16. Another name for a translation
 ___ 17. the name for one arm of an angle
 ___ 18. an instrument for measuring angles
 ___ 19. the name for the line joining two points
 ___ 20. a point where two arms of an angle meet
 ___ 21. a collective term for reflections, rotations, and translations

Match the correct term to each of the following descriptions.

- | | |
|----------------|-------------|
| a. acute | e. right |
| b. equilateral | f. scalene |
| c. isosceles | g. triangle |
| d. obtuse | h. vertex |

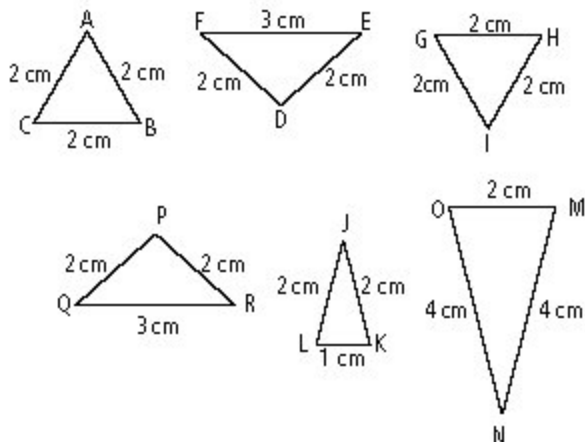
- ___ 22. a close, three-sided shape
 ___ 23. a point where two sides of a figure meet

- _____ 24. a triangle with all sides equal
- _____ 25. a triangle with no equal sides
- _____ 26. a triangle containing a 90° angle
- _____ 27. a triangle with all three angles less than 90°
- _____ 28. a triangle with an angle that is greater than 90°

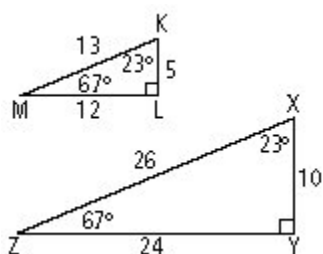
Short Answer

Write your answer in the space provided.

- 29. Write two different ways that you can classify a triangle.
- 30. Use a protractor and ruler to draw each triangle. Then, classify each triangle in two ways.
 - a) one angle of 60° between two sides measuring 3.5 cm and 4.0 cm
 - b) one side measuring 8 cm between angles of 90° and 45°
 - c) three angles measuring 60°
- 31. Use a ruler and a protractor to draw each triangle. Then, classify the triangle in two ways.
 - a) In $\triangle DEF$, $\angle D$ is 55° , $EF = 6$ cm, and $DE = 7$ cm.
 - b) In $\triangle GHI$, $\angle H$ is a right angle, $GH = 4$ cm, and $HI = 4$ cm.
 - c) In $\triangle KLM$, $\angle L$, $\angle M$, and $\angle K$ are 60° .
- 32. Draw an isosceles trapezoid. Explain why this is an appropriate name.
- 33. List the six types of quadrilaterals, and sort them into two groups. Explain each grouping.
- 34. What are the properties of geometric figures that you can examine to classify quadrilaterals?
- 35. Draw and classify a quadrilateral that matches each of the following descriptions.
 - a) MN is parallel to OP .
 $\angle MOP$ is a right angle.
 One angle is obtuse.
 - b) Opposite sides are parallel.
 All sides are of equal length.
 All angles are right angles.
 - c) Opposite sides are parallel.
 All sides are of equal length.
 Two opposite angles are obtuse.
- 36. Michael has a rectangular swimming pool that measures 4 m by 8 m. Maria has a pool that measures 3.8 m by 7.6 m. Are the two swimming pools congruent? Give reasons for your answer.
- 37. Two triangles each has an angle that measures 75° . Are the triangles congruent? Explain your answer.
- 38. Draw two similar and two congruent figures. Explain the differences between similar and congruent.
- 39. Which triangles are congruent? Which triangles are similar? Explain why.



40. List and compare the corresponding angles and sides of $\triangle KLM$ and $\triangle XYZ$. Are these triangles similar? Give reasons for your answer.



Problem

Write your answer in the space provided.

41. Draw and identify the different types of triangles that can be formed by connecting three dots on a 5 by 5 grid of dots.



42. Identify the geometric figures in each of the following flag designs. Are any of the figures congruent or similar? Explain.



Design A



Design B



Design C

Ch 2 - 2D Geometry

Answer Section

TRUE/FALSE

1. ANS: F

In a right triangle, one angle is 90° and the other two angles are less than 90° . It cannot be similar to an obtuse triangle which has an angle that measures more than 90° .

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 2.1
STO: GSS-7m47 TOP: Geometry and Spatial Sense KEY: Right, Obtuse

2. ANS: F

A rhombus is a parallelogram. It has two pairs of opposite parallel sides and all four sides are equal in length.

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 2.2
STO: GSS-7m47 TOP: Geometry and Spatial Sense KEY: Parallelogram, Rhombus

3. ANS: T

DIF: Level 3 REF: Knowledge/Understanding
OBJ: Section 2.3 STO: GSS-7m49 TOP: Geometry and Spatial Sense
KEY: Congruent

4. ANS: F

These two shapes have the same shape and size, so they are congruent.

DIF: Level 2 REF: Knowledge/Understanding OBJ: Section 2.4
STO: GSS-7m49 TOP: Geometry and Spatial Sense KEY: Similar, Congruent

5. ANS: F

Similar figures are not always the same size, so they may not be congruent.

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 2.4
STO: GSS-7m49 TOP: Geometry and Spatial Sense KEY: Similar, Congruent

MULTIPLE CHOICE

6. ANS: **A** DIF: Level 2 REF: Application OBJ: Section 2.1
STO: GSS-7m47 TOP: Geometry and Spatial Sense KEY: Acute

7. ANS: A DIF: Level 3 REF: Application OBJ: Section 2.1
STO: GSS-7m47 TOP: Geometry and Spatial Sense KEY: Right, Scalene

8. ANS: A DIF: Level 2 REF: Knowledge/Understanding
OBJ: Section 2.2 STO: GSS-7m47 TOP: Geometry and Spatial Sense
KEY: Quadrilateral

9. ANS: B DIF: Level 3 REF: Application OBJ: Section 2.2
STO: GSS-7m47 TOP: Geometry and Spatial Sense KEY: Rhombus

10. ANS: D DIF: Level 2 REF: Application OBJ: Section 2.3
STO: GSS-7m47 TOP: Geometry and Spatial Sense KEY: Congruent

COMPLETION

11. ANS: obtuse

DIF: Level 2
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

OBJ: Section 2.1
KEY: Obtuse

12. ANS: acute

DIF: Level 2
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

OBJ: Section 2.1
KEY: Acute

13. ANS:
congruent
scalene

DIF: Level 2
STO: GSS-7m49

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

OBJ: Section 2.3
KEY: Congruent, Scalene

MATCHING

14. ANS: D
OBJ: Section 2.1
KEY: Rotation

DIF: Level 1
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

15. ANS: B
OBJ: Section 2.1
KEY: Rotation

DIF: Level 1
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

16. ANS: C
OBJ: Section 2.1
KEY: Translation

DIF: Level 1
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

17. ANS: A
OBJ: Section 2.1
KEY: Ray

DIF: Level 1
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

18. ANS: F
OBJ: Section 2.1
KEY: Protractor

DIF: Level 1
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

19. ANS: G
OBJ: Section 2.1
KEY: Line Segment

DIF: Level 1
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

20. ANS: E
OBJ: Section 2.1
KEY: Vertex

DIF: Level 1
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

21. ANS: H
OBJ: Section 2.1
KEY: Transformation

DIF: Level 1
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

22. ANS: G
OBJ: Section 2.1
KEY: Triangle

DIF: Level 2
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

23. ANS: H
OBJ: Section 2.1
KEY: Vertex

DIF: Level 2
STO: GSS-7m47

REF: Knowledge/Understanding
TOP: Geometry and Spatial Sense

24. ANS: B
DIF: Level 2
REF: Knowledge/Understanding

- OBJ: Section 2.1 STO: GSS-7m47 TOP: Geometry and Spatial Sense
KEY: Equilateral
25. ANS: F DIF: Level 2 REF: Knowledge/Understanding
OBJ: Section 2.1 STO: GSS-7m47 TOP: Geometry and Spatial Sense
KEY: Scalene
26. ANS: E DIF: Level 2 REF: Knowledge/Understanding
OBJ: Section 2.1 STO: GSS-7m47 TOP: Geometry and Spatial Sense
KEY: Right
27. ANS: A DIF: Level 2 REF: Knowledge/Understanding
OBJ: Section 2.1 STO: GSS-7m47 TOP: Geometry and Spatial Sense
KEY: Acute
28. ANS: D DIF: Level 2 REF: Knowledge/Understanding
OBJ: Section 2.1 STO: GSS-7m47 TOP: Geometry and Spatial Sense
KEY: Obtuse

SHORT ANSWER

29. ANS:
You can classify a triangle by its angle measures.
You can classify a triangle by its side lengths.
- DIF: Level 3 REF: Communication OBJ: Section 2.1
STO: GSS-7m47 TOP: Geometry and Spatial Sense KEY: Triangle
30. ANS:
a) acute scalene triangle
b) right isosceles triangle
c) acute equilateral triangle
- DIF: Level 3 REF: Application OBJ: Section 2.1 STO: GSS-7m47
TOP: Geometry and Spatial Sense KEY: Triangle
31. ANS:
a) acute scalene triangle
b) right isosceles triangle
c) acute equilateral triangle
- DIF: Level 3 REF: Application OBJ: Section 2.1 STO: GSS-7m47
TOP: Geometry and Spatial Sense KEY: Triangle
32. ANS:
Drawings will vary.
This quadrilateral has only one pair of opposite sides that are parallel, and the other pair of opposite sides are of equal length.
- DIF: Level 3 REF: Communication OBJ: Section 2.2
STO: GSS-7m47 TOP: Geometry and Spatial Sense KEY: Quadrilateral
33. ANS:
The six types of quadrilaterals are rectangles, squares, parallelograms, rhombuses, kites, and trapezoids.
Group 1: rectangles, squares, parallelograms, rhombuses. These quadrilaterals have two pairs of opposite sides that are parallel.
Group 2: kites and trapezoids. These quadrilaterals do not have two pairs of opposite sides that are parallel.

DIF: Level 3 REF: Communication OBJ: Section 2.2
 STO: GSS-7m47 TOP: Geometry and Spatial Sense KEY: Quadrilateral

34. ANS:

You can examine the side lengths, the angle measures, and if the sides are parallel.

DIF: Level 3 REF: Communication OBJ: Section 2.2
 STO: GSS-7m47 TOP: Geometry and Spatial Sense KEY: Quadrilateral

35. ANS:

- a) MNPO is a trapezoid.
- b) The quadrilateral is a square.
- c) The quadrilateral is a rhombus.

DIF: Level 3 REF: Application OBJ: Section 2.2 STO: GSS-7m47
 TOP: Geometry and Spatial Sense KEY: Quadrilateral

36. ANS:

Compare the corresponding sides:

For Michael's pool, width = 4 m and length = 8 m

For Maria's pool, width = 3.8 m and length = 7.6 m

The corresponding sides are not the same. The swimming pools are not congruent.

DIF: Level 3 REF: Communication OBJ: Section 2.3
 STO: GSS-7m49 TOP: Geometry and Spatial Sense KEY: Similar

37. ANS:

The triangles may not be congruent. A triangle with one angle of 75° can be a right triangle, an isosceles triangle, or a scalene triangle.

DIF: Level 3 REF: Communication OBJ: Section 2.3
 STO: GSS-7m49 TOP: Geometry and Spatial Sense KEY: Congruent

38. ANS:



Diagrams will vary.

Congruent figures have the same shape and size.



Similar figures have the same shape but not the same size.

DIF: Level 3 REF: Communication OBJ: Section 2.4
 STO: GSS-7m49 TOP: Geometry and Spatial Sense KEY: Congruent, Similar



39. ANS:

ABC and GHI are congruent because:

$AB = GH$, $BC = HI$, $AC = GI$

DEF and PQR are congruent because:

$DE = PQ$, $EF = QR$, $DF = PR$

JKL and LMN are similar because:

$$\frac{JK}{NM} = \frac{KL}{MO} = \frac{JL}{NO} = \frac{1}{2}$$

DIF: Level 3 REF: Communication OBJ: Section 2.4
 STO: GSS-7m49 TOP: Geometry and Spatial Sense KEY: Congruent, Similar

40. ANS:

Compare the corresponding angles:

$$\angle A = \angle X$$

$$\angle L = \angle Y$$

$$\angle K = \angle X$$

Compare the corresponding sides:

$$\frac{KL}{XY} = \frac{5}{10} \quad \frac{LM}{YZ} = \frac{12}{24} \quad \frac{KM}{XZ} = \frac{13}{26}$$

Each side of $\triangle KLM$ is half the corresponding side of $\triangle XYZ$.

$\triangle KLM$ and $\triangle XYZ$ are similar because they have the same shape but not the same size.

DIF: Level 3

REF: Communication

OBJ: Section 2.4

STO: GSS-7m49

TOP: Geometry and Spatial Sense

KEY: Similar

PROBLEM

41. ANS:

- acute isosceles
- acute scalene
- obtuse isosceles
- obtuse scalene
- right isosceles
- right scalene

DIF: Level 3

REF: Thinking/Inquiry/Problem Solving

OBJ: Section 2.1

STO: GSS-7m47

TOP: Geometry and Spatial Sense

KEY: Triangle

42. ANS:

Design A:

- The flag has two right scalene triangles, three obtuse isosceles triangles, and two trapezoids.
- The two right scalene triangles are congruent.
- The three obtuse isosceles triangles are similar.
- The two trapezoids are similar.

Design B:

- The flag has one equilateral triangle, one obtuse isosceles triangle, and two trapezoids. b)
- The two trapezoids are congruent.

Design C:

- The flag has one equilateral triangle, and two trapezoids.
- The two trapezoids are congruent.

DIF: Level 3

REF: Thinking/Inquiry/Problem Solving

OBJ: Section 2.4

STO: GSS-7m49

TOP: Geometry and Spatial Sense

KEY: Congruent, Similar