**Ch 13 Geometry of Transformations Practice Test**

**True/False**

*Indicate whether the sentence or statement is true or false.*

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

\_\_\_\_ 1. A frieze pattern repeats in many directions.

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\_\_\_\_ 2. An image from a transformation cannot be congruent to the original figure.

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\_\_\_\_ 3. Translations, rotations, and reflections change the sides or angles of the original figure.

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\_\_\_\_ 4. A translation arrow describes the translation of a figure on a coordinate grid..

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\_\_\_\_ 5. Translations cannot be carried out on a coordinate grid.

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\_\_\_\_ 6. The image of a point after a transformation is often named using the prime symbol.

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\_\_\_\_ 7. A tiling pattern covers a plane with some overlapping and leaving some gaps.

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\_\_\_\_ 8. Tiling a plane refers to using repeated congruent shapes cover a region completely.

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\_\_\_\_ 9. A circle can be used to tile a plane.

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\_\_\_\_ 10. There are four types of regular figures that can tile a plane.

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\_\_\_\_ 11. You cannot use rotations to tessellate a plane.

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**Multiple Choice**

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

\_\_\_\_ 12. The transformation that is a slide along a straight line is called a(n)

|  |  |  |  |
| --- | --- | --- | --- |
| a. | translation. | c. | reflection. |
| b. | rotation. | d. | image. |

\_\_\_\_ 13. The transformation that is a turn about a fixed point is called a(n)

|  |  |  |  |
| --- | --- | --- | --- |
| a. | translation. | c. | reflection. |
| b. | rotation. | d. | image. |

\_\_\_\_ 14. Identify the following transformation.



|  |  |  |  |
| --- | --- | --- | --- |
| a. | translation | c. | reflection |
| b. | rotation | d. | image |

\_\_\_\_ 15. Which transformation do you use in a game of checkers?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | translation | c. | reflection |
| b. | rotation | d. | none of the above |

\_\_\_\_ 16. Which transformation may a skier use?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | translation | c. | reflection |
| b. | rotation | d. | both a and b |

\_\_\_\_ 17. Which of the following is formed by three square tiles?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | tetromino | c. | triomino |
| b. | domino | d. | pentomino |

\_\_\_\_ 18. Square tiles can be combined to make different shapes. Which of the following is not one of them?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | tetromino | c. | domino |
| b. | pentomino | d. | omino |

\_\_\_\_ 19. When you read A, B, and C of a figure in alphabetical order, we say that the \_\_\_\_ of this triangle is clockwise.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | sense | c. | feeling |
| b. | time | d. | none of the above |

\_\_\_\_ 20. The figure below is an example of a

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|  |  |  |  |
| --- | --- | --- | --- |
| a. | hexomino. | c. | triomino. |
| b. | tetromino. | d. | pentomino. |

\_\_\_\_ 21. Point A(4, 5) is translated 2 units left and 3 units up. What are the new coordinates of point A?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | (2, 8) | c. | (2, 2) |
| b. | (6, 8) | d. | (6, 2) |

\_\_\_\_ 22. Point C(0, 3) is translated 3 units right and 1 unit down. What are the new coordinates of point C?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | (3, 2) | c. | (2, 2) |
| b. | (3, 4) | d. | (2, 3) |

**Completion**

*Complete each sentence or statement.*

 23. Three common types of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are translations, rotations, and reflections.

 24. The transformation that is a slide along a straight line is called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 25. The transformation that is a flip over a mirror line is called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 26. A(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is needed for a reflection to occur.

 27. A fixed point about which a rotation occurs is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 28. A(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can describe the translation of a figure on a coordinate grid.

 29. A polygon with all sides and all angles equal is a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 30. A(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a picture or design made of small shapes of different colours.

**Short Answer**

*Write your answer in the space provided.*

 31. Name the type of transformation that moves parallelogram ABCD onto its image, parallelogram A’B’C’D’.



 32. Use a 180º rotation to create images of the restaurant sign in the squares provided.

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 33. Where would you place a mirror line on a coordinate grid so that the image of a figure is standing right beside it?

 34. Design a frieze pattern that involves the translation and rotation of an irregular figure.

 35. Find the coordinates of the image of each point after the given translation.

a) A (1, 1); 3 units right

b) B (3, 1); 1 unit down

c) C (4, 2); 1 unit right and 2 units up

 36. Describe the transformation that moves the figure onto its image.

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 37. A figure has vertices at A(1, 5), B(2, 5), C( 2, 4), D( 3,4) E(3, 3), F( 4,3), G( 4,2), and H(1, 2). Draw the figure on the coordinate grid. Identify the image, and draw the image of the figure after a reflection along the mirror line. The mirror line is formed by joining the points (5, 6) and (5, 1).

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 38. Can any quadrilateral cover a plane? Explain.

 39. Can a parallelogram tile the plane? Explain.

**Problem**

*Write your answer in the space provided.*

 40. Use a parallelogram to create an interesting tile. Use the tile to tessellate a plane.

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**Ch 13 Geometry of Transformations Practice Test**

**Answer Section**

**TRUE/FALSE**

 1. ANS: F

A frieze pattern repeats in one direction.

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 13.1

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Frieze

 2. ANS: F

An image from a transformation can be congruent to the original figure.

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 13.1

STO: GSS-7m49 TOP: Geometry and Spatial Sense KEY: Congruent

 3. ANS: F

Translations, rotations, and reflections do not change the sides or angles of the original figure. The image (transformed figure) is congruent to the original figure.

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 13.1

STO: GSS-7m50 TOP: Geometry and Spatial Sense KEY: Transformation

 4. ANS: T DIF: Level 1 REF: Knowledge/Understanding

OBJ: Section 13.3 STO: GSS-7m51 TOP: Geometry and Spatial Sense

KEY: Translation

 5. ANS: F

Translations can be carried out on a coordinate grid.

DIF: Level 2 REF: Knowledge/Understanding OBJ: Section 13.3

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Translation

 6. ANS: T DIF: Level 3 REF: Knowledge/Understanding

OBJ: Section 13.3 STO: GSS-7m50 TOP: Geometry and Spatial Sense

KEY: Image

 7. ANS: F

A tiling pattern covers a plane without overlapping or leaving gaps.

DIF: Level 2 REF: Knowledge/Understanding OBJ: Section 13.4

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Tiling

 8. ANS: T DIF: Level 3 REF: Knowledge/Understanding

OBJ: Section 13.4 STO: GSS-7m51 TOP: Geometry and Spatial Sense

KEY: Tiling

 9. ANS: F

A circle cannot be used to tile a plane.

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 13.4

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Tiling

 10. ANS: F

There are three types of regular figures that can tile a plane.

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 13.4

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Tiling

 11. ANS: F

You can use rotations to tessellate a plane.

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 13.6

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Tessellation

**MULTIPLE CHOICE**

 12. ANS: A DIF: Level 1 REF: Knowledge/Understanding

OBJ: Section 13.1 STO: GSS-7m50 TOP: Geometry and Spatial Sense

KEY: Translation

 13. ANS: B DIF: Level 1 REF: Knowledge/Understanding

OBJ: Section 13.1 STO: GSS-7m50 TOP: Geometry and Spatial Sense

KEY: Rotation

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

OBJ: Section 13.1 STO: GSS-7m50 TOP: Geometry and Spatial Sense

KEY: Rotation

 15. ANS: A DIF: Level 2 REF: Knowledge/Understanding

OBJ: Section 13.1 STO: GSS-7m50 TOP: Geometry and Spatial Sense

KEY: Translation

 16. ANS: D DIF: Level 2 REF: Knowledge/Understanding

OBJ: Section 13.1 STO: GSS-7m50 TOP: Geometry and Spatial Sense

KEY: Translation, Rotation

 17. ANS: C DIF: Level 2 REF: Knowledge/Understanding

OBJ: Section 13.1 STO: GSS-7m51 TOP: Geometry and Spatial Sense

KEY: Square Tiles

 18. ANS: D DIF: Level 3 REF: Knowledge/Understanding

OBJ: Section 13.1 STO: GSS-7m51 TOP: Geometry and Spatial Sense

KEY: Square Tiles

 19. ANS: A DIF: Level 4 REF: Knowledge/Understanding

OBJ: Section 13.1 STO: GSS-7m51 TOP: Geometry and Spatial Sense

KEY: Congruent

 20. ANS: D DIF: Level 3 REF: Knowledge/Understanding

OBJ: Section 13.1 STO: GSS-7m51 TOP: Geometry and Spatial Sense

KEY: Square Tiles

 21. ANS: A DIF: Level 2 REF: Application OBJ: Section 13.3

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Translation

 22. ANS: A DIF: Level 3 REF: Application OBJ: Section 13.3

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Translation

**COMPLETION**

 23. ANS: transformation

DIF: Level 1 REF: Knowledge/Understanding OBJ: Section 13.1

STO: GSS-7m50 TOP: Geometry and Spatial Sense KEY: Transformation

 24. ANS: translation

DIF: Level 1 REF: Knowledge/Understanding OBJ: Section 13.1

STO: GSS-7m50 TOP: Geometry and Spatial Sense KEY: Translation

 25. ANS: reflection

DIF: Level 1 REF: Knowledge/Understanding OBJ: Section 13.1

STO: GSS-7m50 TOP: Geometry and Spatial Sense KEY: Reflection

 26. ANS: mirror line

DIF: Level 2 REF: Knowledge/Understanding OBJ: Section 13.1

STO: GSS-7m50 TOP: Geometry and Spatial Sense KEY: Reflection

 27. ANS: turn centre

DIF: Level 2 REF: Knowledge/Understanding OBJ: Section 13.1

STO: GSS-7m50 TOP: Geometry and Spatial Sense KEY: Rotation

 28. ANS: translation arrow

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 13.3

STO: GSS-7m50 TOP: Geometry and Spatial Sense KEY: Translation

 29. ANS: regular polygon

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 13.4

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Polygon

 30. ANS: mosaic

DIF: Level 4 REF: Knowledge/Understanding OBJ: Section 13.4

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Mosaic

**SHORT ANSWER**

 31. ANS:

Parallelogram ABCD is moved onto parallelogram A’B’C’D’ by a rotation.

DIF: Level 2 REF: Application OBJ: Section 13.1 STO: GSS-7m50

TOP: Geometry and Spatial Sense KEY: Rotation

 32. ANS:

Responses will vary depending on the turn centre. One possible set of images is

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DIF: Level 2 REF: Application OBJ: Section 13.1 STO: GSS-7m50

TOP: Geometry and Spatial Sense KEY: Rotation

 33. ANS:

Place the mirror line along the *y*-axis.

DIF: Level 3 REF: Communication OBJ: Section 13.1

STO: GSS-7m50 TOP: Geometry and Spatial Sense KEY: Reflection

 34. ANS:

Patterns will vary.

DIF: Level 3 REF: Thinking/Inquiry/Problem Solving OBJ: Section 13.2

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Frieze

 35. ANS:

a) A (4, 1)

b) B (3, 0)

c) C (5, 4)

DIF: Level 2 REF: Application OBJ: Section 13.3 STO: GSS-7m51

TOP: Geometry and Spatial Sense KEY: Coordinate Grid

 36. ANS:

The figure has been translated 4 units right and 1 unit up.

DIF: Level 2 REF: Application OBJ: Section 13.3 STO: GSS-7m51

TOP: Geometry and Spatial Sense KEY: Translation

 37. ANS:

The figure is in the shape of a set of stairs.

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DIF: Level 3 REF: Application OBJ: Section 13.3 STO: GSS-7m51

TOP: Geometry and Spatial Sense KEY: Coordinate Grid

 38. ANS:

Any quadrilateral can cover a plane. The sum of all angles inside a quadrilateral equals 360º.

DIF: Level 3 REF: Communication OBJ: Section 13.4

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Tiling

 39. ANS:

Yes. A parallelogram is a quadrilateral and any quadrilateral can tile a plane.

DIF: Level 3 REF: Communication OBJ: Section 13.4

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Tiling

**PROBLEM**

 40. ANS:

Tessellations will vary, but there should not be gaps or overlaps on the plane.

DIF: Level 3 REF: Thinking/Inquiry/Problem Solving OBJ: Section 13.5

STO: GSS-7m51 TOP: Geometry and Spatial Sense KEY: Tessellation