

Geometry Cumulative Exam Study Guide

Semester 1 Exam

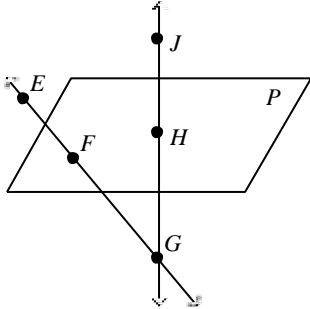
Name: _____

Date: _____

Period: _____

Multiple Choice - Identify the choice that best completes the statement or answers the question.

____ 1. Which set of three points is collinear?



- a. J, E, H
- b. J, E, F
- c. J, H, G
- d. F, G, H

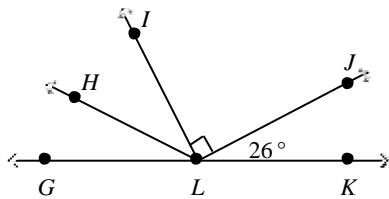
____ 2. Which of the following is not an undefined term?

- a. segment
- b. line
- c. plane
- d. point

____ 3. Point B lies on \overline{AC} between A and C .

- $AB = 5x - 7$ and $BC = 3x + 8$. Find AC .
- a. $8x + 15$
 - b. $8x - 1$
 - c. $8x + 1$
 - d. $8x - 15$

____ 4. \overrightarrow{LH} bisects $\angle GLI$. What is the measure of $\angle K LH$?



- a. 32°
- b. 148°
- c. 64°
- d. 116°

____ 5. \overrightarrow{RT} bisects $\angle QRS$. if $m\angle QRT = 46^\circ$, what is $m\angle QRS$?

- a. 46°
- b. 134°
- c. 23°
- d. 92°

____ 6. Suppose \overleftrightarrow{AB} and \overleftrightarrow{DC} lie in the same plane and are perpendicular to \overleftrightarrow{PQ} . What is the relationship between \overleftrightarrow{AB} and \overleftrightarrow{DC} ?

- a. \overleftrightarrow{AB} and \overleftrightarrow{DC} are parallel.
- b. \overleftrightarrow{AB} and \overleftrightarrow{DC} are perpendicular.
- c. \overleftrightarrow{AB} and \overleftrightarrow{DC} are skew.
- d. \overleftrightarrow{AB} and \overleftrightarrow{DC} are transversals.

____ 7. If $\angle 1$ and $\angle 2$ are vertical angles and $m\angle 1 = 2x + 15$ and $m\angle 2 = 4x - 25$, what is $m\angle 1$?

- a. 40°
- b. 20°
- c. 80°
- d. 55°

____ 8. Find the perimeter of a square if one side measures 10 inches.

- a. 40 inches
- b. 14 inches
- c. 100 inches
- d. 20 inches

____ 9. Find the distance between the points $(-7, -5)$ and $(1, 0)$.

- a. $\sqrt{61}$
- b. $\sqrt{11}$
- c. $\sqrt{89}$
- d. $\sqrt{39}$

____10. Which statement has a *false* truth value?

- a. If a polygon is equilateral, then it is a regular polygon.
- b. If an angle is obtuse, then the angle measure is greater than 90 degrees.
- c. If two lines intersect twice, then they will form complementary angles.
- d. If a pentagon has fewer than 5 sides, then the sides will be congruent.

____11. Determine the midpoint of the points $(-6, -1)$ and $(-8, 4)$.

- a. $(1, -2.5)$
- b. $(-7, 1.5)$
- c. $(-1, -4.5)$
- d. $(-3.5, -2)$

____12. On a number line, point G is located at -9 and point H is located at -3 . What is the midpoint of \overline{GH} ?

- a. 6
- b. -3
- c. 3
- d. -6

____13. What is the area of a triangle with a base of 5 feet and a height of 10 feet?

- a. 15 ft^2
- b. 50 ft^2
- c. 25 ft^2
- d. 30 ft^2

____14. Find the distance between the points $(2, -3)$ and $(5, -1)$.

- a. $\sqrt{33}$
- b. $\sqrt{65}$
- c. $\sqrt{5}$
- d. $\sqrt{13}$

____15. Which of the following is a counterexample to the following conjecture? If $x^2 = 4$, then $x = 2$.

- a. $x = -2$
- b. $x = 4$
- c. $x = 2$
- d. $x = -4$

____16. If all angles and all sides of a polygon are congruent, how can the polygon be classified?

- a. It is regular.
- b. It is equilateral.
- c. It is a quadrilateral.
- d. It is convex.

____17. What is the equation of a line that has slope $\frac{1}{2}$ and passes through $(2, 4)$?

- a. $y = \frac{1}{2}x + 3$
- b. $y = \frac{1}{2}x - 3$
- c. $y = \frac{1}{2}x + 4$
- d. $y = \frac{1}{2}x + 2$

____18. Determine the slope of the line containing points $(-5, 1)$ and $(-7, -9)$.

- a. 5
- b. -5
- c. $\frac{1}{5}$
- d. $-\frac{1}{5}$

____19. Determine the hypothesis of the statement: If p , then q .

- a. p
- b. $\sim p$
- c. q
- d. $\sim q$

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____20. In $\triangle ABC$, $m\angle A = 35^\circ$ and $m\angle B = 71^\circ$. What is $m\angle C$?

- a. 106° c. 109°
b. 74° d. 36°

____21. What is the interior angle measure of a regular hexagon?

- a. 360° c. 60°
b. 180° d. 120°

____22. Find the measure of each exterior angle for a regular pentagon.

- a. 72° c. 540°
b. 108° d. 180°

____23. Find the area of a trapezoid with parallel sides measuring 8 feet and 11 feet and a height of 4 feet.

- a. 352 ft^2 c. 9.5 ft^2
b. 38 ft^2 d. 176 ft^2

____24. If $16 = 2x - 4$, then $2x - 4 = 16$. This is an example of which property of equality?

- a. symmetric c. multiplication
b. addition d. subtraction

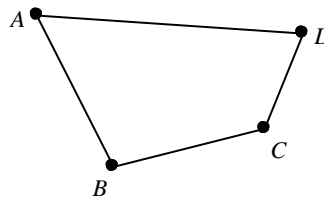
____25. A major arc has a measure of $(2x + 45)^\circ$. Its corresponding minor arc has a measure of $(3x - 25)^\circ$. Find x .

- a. 68 c. 70
b. 181 d. 32

____26. Find a line that is parallel to $y = 3x - 7$ and passes through point (6, 4).

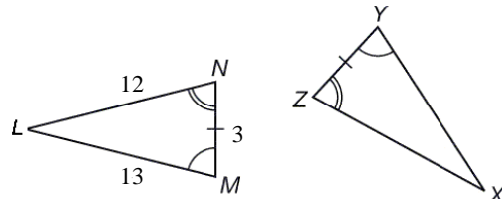
- a. $y = 3x - 14$ c. $y = 3x + 2$
b. $y = 3x + 14$ d. $y = 3x - 2$

____27. What is the included side of $\angle C$ and $\angle B$?



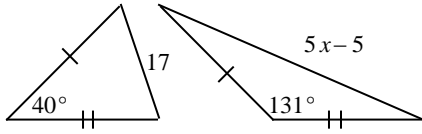
- a. \overline{AB} c. \overline{AD}
b. \overline{BC} d. \overline{CD}

____28. What is the measure of \overline{XZ} ?



- a. 12 c. 13
b. 3 d. 28

29. Write an inequality that gives the possible values of x in the diagram.

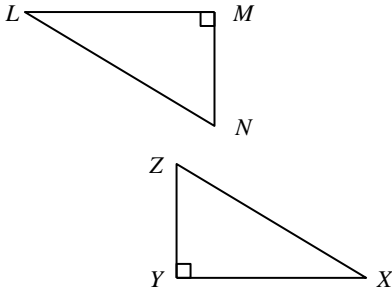


- a. $40 < 5x - 5$
- b. $17 > 5x - 5$
- c. $40 > 5x - 5$
- d. $17 < 5x - 5$

30. In parallelogram $QRST$, if $\angle Q$ measures 66° , what is the measure of $\angle T$?

- a. 33°
- b. 114°
- c. 24°
- d. 66°

31. Suppose $\overline{LM} \cong \overline{XY}$ and $\angle L \cong \angle X$. If $m\angle N = 37^\circ$, what is $m\angle Z$?

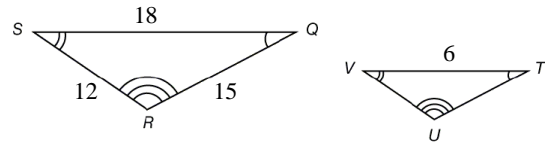


- a. 53°
- b. 37°
- c. 90°
- d. 127°

32. What is the equation of a line that is perpendicular to $y = -6x$ and passes through $(0, 3)$?

- a. $y = \frac{1}{6}x + 3$
- b. $y = -\frac{1}{6}x + 3$
- c. $y = -6x + 3$
- d. $y = 6x + 3$

33. Given the following similar triangles, find the length of \overline{UV} .



- a. 36
- b. 3
- c. 4
- d. 5

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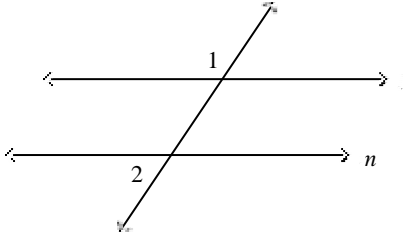
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Numeric Response

34. Lines l and m are parallel. If $m\angle 1 = 111^\circ$, how many degrees is $m\angle 2$?



35. Point B lies on \overline{AC} between A and C . $AB = 7.6$ and $AC = 14.9$. Find BC .

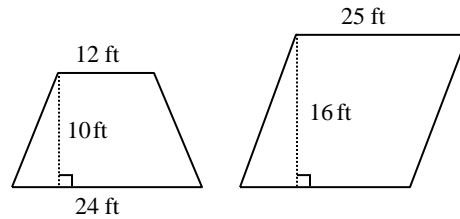
36. Angle S is complementary to angle T . If $m\angle S = 15^\circ$, how many degrees is $m\angle T$?

37. How many units is the perimeter of a rectangle with a length of 15 units and a width of 3 units?

38. A 15-foot ladder leans against the side of a house. The base of the ladder rests on the ground 9 feet away from the house. If the side of the house and the ground intersect at a right angle, how many feet up does the ladder reach?

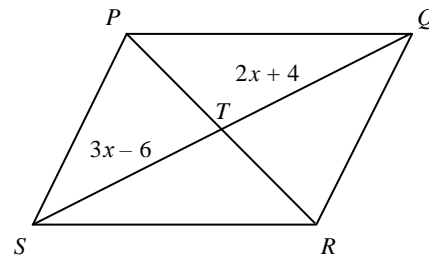
39. A farmer wants to build a rectangular garden 12 feet long and 9 feet wide. How many feet of fencing should he buy?

40. Amy is painting two murals in her art studio. One is shaped like a trapezoid and the other is shaped like a parallelogram. Use the diagram to find how many square feet Amy will need to paint.



41. Find the circumference of a circle with a diameter of 16. Use 3.14 for π .

42. $PQRS$ is a parallelogram. Find the value of x .



43. Find the distance between the point $(10, 3)$ and the line $x = 1$.

44. Hexagons $ABCDEF$ and $GHIJKL$ are regular hexagons and are similar to each other. The similarity ratio of $ABCDEF$ to $GHIJKL$ is 1:2. Find the perimeter of $GHIJKL$ if $AB=8$.

Problem

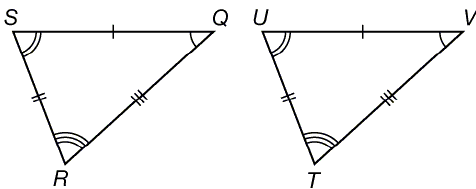
45. Draw the following: \overleftrightarrow{RS} and \overleftrightarrow{ST} intersect in plane Q .

46. Formulate a conjecture about how the next step in this pattern would be found:

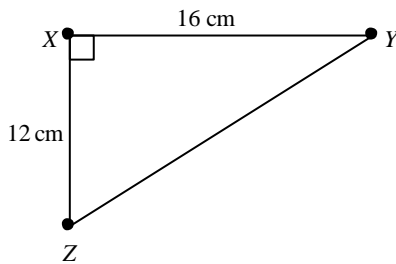
1, -4, 16, -64, 256, -1024,...

47. In $\triangle DEF$, $m\angle F = 28^\circ$ and the exterior angle at vertex E measures 80° . Make a sketch of $\triangle DEF$ showing the given interior and exterior angle measures.

48. Identify the congruent sides and angles of the two triangles below and write six congruency statements.

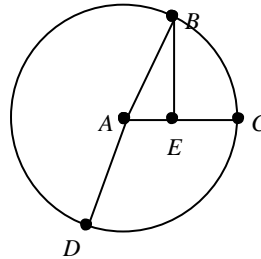


49. Classify $\triangle XYZ$ and calculate its perimeter and area.



- Find YZ .
- Classify $\triangle XYZ$ by sides. Justify your answer.
- Is $\triangle XYZ$ an acute triangle? Justify your answer.
- Find the perimeter of $\triangle XYZ$.
- Find the area of $\triangle XYZ$.

50. In $\odot A$, $AE = 8$ inches, $BE = 15$ inches, $AB = 17$ inches, $m\angle BAC = 62^\circ$, and $m\angle DAC = 104^\circ$.



- Is $\triangle ABE$ a right triangle? Explain how you know.
- Find the circumference of $\odot A$ to the nearest tenth inch. Use 3.14 for π .
- Find the area of $\odot A$ to the nearest tenth square inch. Use 3.14 for π .
- What is $m\widehat{BD}$? Use the Arc Addition Postulate to justify your answer.

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Semester 1 Exam Study Guide Answer Section

MULTIPLE CHOICE

1. ANS: C PTS: 1 REF:
Lesson 1: Points, Lines, and Planes
NAT: NCTM G.1a TOP: Benchmark Test 1
2. ANS: A PTS: 1 REF:
Lesson 1: Points, Lines, and Planes
NAT: NCTM CM.1d TOP:
Benchmark Test 2
MSC: Geom_S01_00002
3. ANS: C PTS: 1 REF:
Lesson 2: Segments
NAT: NCTM A.2a TOP: Benchmark Test 2
4. ANS: B PTS: 1 REF:
Lesson 3: Angles
NAT: NCTM G.1d TOP: Benchmark Test 1
5. ANS: D PTS: 1 REF:
Lesson 3: Angles
NAT: NCTM G.1d TOP: Benchmark Test 2
6. ANS: A PTS: 1 REF:
Lesson 5: More Theorems About Lines and
Planes
NAT: NCTM G.1c TOP: Benchmark Test 1
7. ANS: D PTS: 1 REF:
Lesson 6: Identifying Pairs of Angles
NAT: NCTM G.1d TOP: Benchmark Test 1
8. ANS: A PTS: 1 REF:
Lesson 8: Using Formulas in Geometry
NAT: NCTM G.1a TOP: Benchmark Test 1
9. ANS: C PTS: 1 REF:
Lesson 9: Finding Length: Distance Formula
NAT: NCTM G.1d TOP: Benchmark Test 1
10. ANS: A PTS: 1 REF:
Lesson 10: Using Conditional Statements
NAT: NCTM RP.1b TOP:
Benchmark Test 1
MSC: Geom_S01_00012
11. ANS: B PTS: 1 REF:
Lesson 11: Finding Midpoints
NAT: NCTM G.1d TOP: Benchmark Test 1
12. ANS: D PTS: 1 REF:
Lesson 11: Finding Midpoints
NAT: NCTM NO.3a TOP:
Benchmark Test 2
MSC: Geom_S02_00048
13. ANS: C PTS: 1 REF:
Lesson 13: Introduction to Triangles
NAT: NCTM M.2b TOP:
Benchmark Test 2
MSC: Geom_S02_00051
14. ANS: D PTS: 1 REF:
Lesson 9: Finding Length: Distance Formula
NAT: NCTM G.1d TOP: Benchmark Test 2
15. ANS: A PTS: 1 REF:
Lesson 14: Disproving Conjectures with
Counterexamples
NAT: NCTM G.1c TOP: Benchmark Test 1
16. ANS: A PTS: 1 REF:
Lesson 15: Introduction to Polygons
NAT: NCTM G.1b TOP: Benchmark Test 1
17. ANS: A PTS: 1 REF:
Lesson 18: Finding Slopes and Equations of
Lines
NAT: NCTM A.4 TOP: Benchmark Test 1
18. ANS: A PTS: 1 REF:
Lesson 16: Finding Slopes and Equations of
Lines
NAT: NCTM A.4 TOP: Benchmark Test 3
MSC: Geom_S01_00005
19. ANS: A PTS: 1 REF:
Lesson 17: More Conditional Statements
NAT: NCTM CM.1d TOP:
Benchmark Test 1
MSC: Geom_S01_00007
20. ANS: B PTS: 1 REF:
Lesson 18: Finding Theorems
NAT: NCTM G.1d TOP: Benchmark Test 1
21. ANS: D PTS: 1 REF:
Investigation 3: Exploring Angles of Polygons
NAT: NCTM G.1a TOP: Benchmark Test 2
22. ANS: A PTS: 1 REF:
Investigation 3: Exploring Angles of Polygons
NAT: NCTM G.1d TOP: Benchmark Test 3
23. ANS: B PTS: 1 REF:
Lesson 22: Finding Areas of Quadrilaterals
NAT: NCTM M.2b TOP:
Benchmark Test 3
MSC: Geom_S03_00004
24. ANS: A PTS: 1 REF:
Lesson 24: Algebraic Proofs
NAT: NCTM A.2a TOP: Benchmark Test 2
25. ANS: A PTS: 1 REF:
Lesson 26: Central Angles and Arc Measure
NAT: NCTM G.1a TOP: Benchmark Test 3
26. ANS: A PTS: 1

- REF: Lesson 37: Writing Equations of Parallel and Perpendicular Lines
 NAT: NCTM A.4 TOP: Benchmark Test 3
27. ANS: B PTS: 1 REF:
 Lesson 28: Triangle Congruence: SAS
 NAT: NCTM G.1b TOP: Benchmark Test 2
28. ANS: A PTS: 1 REF:
 Lesson 30: Triangle Congruence: ASA and AAS
 NAT: NCTM G.1b TOP: Benchmark Test 2
29. ANS: D PTS: 1 REF:
 Investigation 4: Inequalities in Two Triangles
 NAT: NCTM A.2a TOP: Benchmark Test 2
30. ANS: B PTS: 1 REF:
 Lesson 34: Properties of Parallelograms
 NAT: NCTM G.1d TOP: Benchmark Test 3
31. ANS: B PTS: 1 REF:
 Lesson 36: Right Triangle Congruence Theorems
 NAT: NCTM G.1d TOP: Benchmark Test 2
32. ANS: A PTS: 1
 REF: Lesson 37: Writing Equations of Parallel and Perpendicular Lines
 NAT: NCTM A.4 TOP: Benchmark Test 2
33. ANS: C PTS: 1 REF:
 Lesson 41: Ratios, Proportions, and Similarity
 NAT: NCTM G.1b TOP: Benchmark Test 3

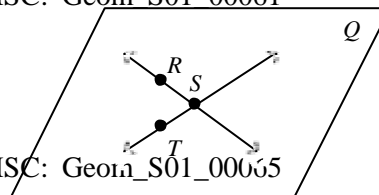
MERIC RESPONSE

34. ANS: 69
 PTS: 1 REF: Investigation 1:
 Transversals and Angle Relationships
 NAT: NCTM G.1d TOP: Benchmark Test 1
35. ANS: 7.3
 PTS: 1 REF: Lesson 2: Segments
 TOP: Benchmark Test 1 MSC:
 Geom_S01_00054
36. ANS: 75
 PTS: 1 REF: Lesson 6: Identifying Pairs
 of Angles
 NAT: NCTM G.1d TOP: Benchmark Test 2
37. ANS: 36
 PTS: 1 REF: Lesson 8: Using Formulas
 in Geometry
 NAT: NCTM M.1 TOP: Benchmark Test 2
38. ANS: 12

- PTS: 1 REF: Investigation 2: Proving
 the Pythagorean Theorem
 MSC: Geom_S04_00048
- NAT: NCTM G.1d TOP: Benchmark Test 1
39. ANS: 42
 MSC: Geom_S03_00009
 PTS: 1 REF: Lesson 19: Introduction to
 Quadrilaterals
 NAT: NCTM G.1a TOP: Benchmark Test 1
40. ANS: 580
 MSC: Geom_S04_00042
 PTS: 1 REF: Lesson 22: Finding Areas
 of Quadrilaterals
 NAT: NCTM M.2b TOP:
 Benchmark Test 2
 MSC: Geom_S03_00056
41. ANS: 50.24
 MSC: Geom_S04_00045
 PTS: 1 REF: Lesson 23: Introduction to
 Circles
 NAT: NCTM G.1a
 TOP: Benchmark Test 3 MSC:
 Geom_S03_00067
42. ANS: 10
 PTS: 1 REF: Lesson 34: Properties of
 Parallelograms
 MSC: Geom_S04_00047
43. ANS: 9
 PTS: 1 REF: Lesson 42: Finding
 Distance from a Point to a Line
 NAT: NCTM G.1d TOP: Benchmark Test 3
44. ANS: 96
 MSC: Geom_S01_00051
 PTS: 1 REF: Lesson 44: Applying
 Similarity
 NAT: NCTM G.1b
 TOP: Benchmark Test 3 MSC:
 Geom_S05_00062

PROBLEM

45. ANS:
 MSC: Geom_S01_00061



MSC: Geom_S01_00055

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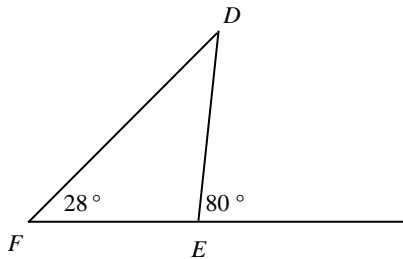
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PTS: 1 REF: Lesson 4: Postulates and Theorems About Points, Lines, and Planes
 NAT: NCTM G.4a TOP: Benchmark Test 1

46. ANS:
 The value that comes next in the sequence is found by multiplying the previous value by -4 .

PTS: 1 REF: Lesson 7: Using Inductive Reasoning
 NAT: NCTM RP.1b TOP: Benchmark Test 1
 MSC: Geom_S01_00118

47. ANS:
 Sample:



PTS: 1 REF: Lesson 18: Triangle Theorems
 NAT: NCTM G.4a
 TOP: Benchmark Test 2 MSC: Geom_S02_00103

48. ANS:
 $\angle S \cong \angle U, \angle Q \cong \angle V, \angle R \cong \angle T, \overline{SQ} \cong \overline{UV}, \overline{QR} \cong \overline{VT},$
 $\overline{SR} \cong \overline{UT}$

PTS: 1 REF: Lesson 25: Triangle Congruence: SSS
 NAT: NCTM G.1b TOP: Benchmark Test 2

49. ANS:
 a. 20 centimeters
 b. Scalene; Sample: Since no sides are congruent, $\triangle XYZ$ is a scalene triangle.
 c. No; Sample: $\triangle XYZ$ is not an acute triangle since $m\angle X = 90^\circ$.
 d. 48 centimeters
 e. 96 square centimeters

PTS: 1 REF: Lesson 13: Introduction to Triangles

NAT: NCTM M.2b TOP: Benchmark Test 1

MSC: Geom_S02_00085

50. ANS: MSC: Geom_S01_00099

a. Yes; Sample: $a^2 + b^2 = c^2, 8^2 + 15^2 = 17^2, 289 = 289$. This triangle is a right triangle by the Pythagorean Theorem.

b. 106.8 inches

c. 907.5 square inches

d. 166° ; Sample: The measure of a minor arc is the same as the measure of its central angle. Since $m\angle BAC = 62^\circ$ and $m\angle DAC = 104^\circ, \widehat{mBC} = 62^\circ$ and $\widehat{mCD} = 104^\circ$. By the arc addition postulate,

$$\widehat{mBD} = \widehat{mBC} + \widehat{mCD} = 62^\circ + 104^\circ = 166^\circ.$$

PTS: 1 REF: Lesson 23: Introduction to Circles
 NAT: NCTM G.1a

TOP: Benchmark Test 2

MSC:

Geom_S03_00078

MSC: Geom_S03_00085