Geometry – Semester Exam Review

- **GET ORGANIZED.** Successful studying begins with being organized. Bring this packet with you to class every day.

- **DO NOT FALL BEHIND.** Do the problems that are assigned every night and come to class prepared to ask about the things you could not do.

- **GET SERIOUS.** The grade you earn on this exam is worth **20% of your semester grade**.

- **MAKE NOTES AS YOU WORK.** As you do these problems, you will come across formulas, definitions, problems, and diagrams that you will want to put on your notecard.

- **NOTECARD:** Your notecard must be in your own writing. You may put on it anything you think will help you on the exam. You may use the front and back. You will turn it in with your exam. You may also use your chart from Chapter 6.

- There is nothing on the exam that you have not studied this year.

- You will turn in your review packet on the day that you take your midterm.

- This packet is worth a **1-weight quiz grade**. This grade is based on:
  - **Completion.** I will check each day to make sure that day’s work is done.
  - **Correctness.** I will check random problems to make sure they are correct, or that you made corrections as needed.
  - **Participation.** I will keep track of people who ask questions, answer questions or put problems on the board. Everyone needs to participate at least three times.

### **Midterm Review Assignments**

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1. _______ Like a dot. Indicates a location.
2. _______ Flat, goes forever in all directions.
3. _______ Has two endpoints. A piece of a line.
4. _______ Straight, goes forever in two directions.
5. _______ Starts at one point and goes forever in one direction.
6. _______ Two points determine a _______.
7. _______ Three non-collinear points determine a _______.
8. _______ Points on the same _______ are _______.
9. _______ Points on the same _______ are _______.
10. _______ Two _______ intersect in a _______.
11. _______ Two _______ intersect in a _______.
12. _______ Two lines that never intersect are _______.

Fill in the blank with the correct word.

23. How many _______ points are on a _______? _______ on a _______? _______ on a _______?

24. Do we ever use three letters to name a segment, line or ray? _______ Careful...this is a common error on the test!

25. When naming a ray, which letter Always goes first? _______.

26. How many _______ can you draw through one point? _______. picture: _______.

Use the diagram to name the following. Use proper notation!

28. In the diagram, name two different _______ that go through point A _______.

29. Now, state two different ways to name the _______ having endpoint A _______.

30. List three _______. _______. _______. 31. How many _______ are on this line? _______.

32. List three different _______. _______. _______. 33. Name the longest _______.

34. List three different ways to name this _______. _______. _______.

35. Use the next picture to name the _______ two different ways _______. _______.

36. List three _______. on this _______. _______. _______. 37. How many _______ are on this _______. _______. _______.

Use the diagram to determine if these are the same. Answer yes or no.

38. _______ and _______ _______. 39. _______ and _______ _______. 40. _______ and _______ _______. 41. _______ and _______ _______.

Use the diagram to name the intersection of each pair of _______.

42. _______ and _______ _______. 43. _______ and _______ _______. 44. _______ and _______ _______. 45. _______ and _______ _______.

46. The name for two coplanar lines that do not intersect is _______. Are B, C and D collinear? _______. C, F, D? _______.

Use the diagrams to name the intersection of each pair of _______.

47. _______ and _______ _______. 48. _______ and _______ _______. 49. _______ and _______ _______. 50. _______ and _______ _______.

51. Since _______ and _______ don’t intersect, they are called _______.

52. In the next picture, the plane that contains lines a and b is _______.

53. The intersection of planes _______ _______. _______.

54. How many _______ are in the intersection of these planes? _______. Are K, F, Q, and D coplanar? _______. Are B, F, Q and D coplanar? _______.

Name: _______
Use the Segment Addition Postulate to find each length.

55. \[ \overline{NP} \quad \overline{PQ} \quad \overline{NQ} = \quad \]

56. \[ \overline{FG} \quad \overline{GH} \quad \overline{XZ} = \quad \]

57. \[ \overline{XZ} = \quad \overline{FG} = \quad \overline{LM} = \quad \]

Use the Segment Addition Postulate to write an ALGEBRAIC EQUATION. Then, solve the equation for \( x \).

61. \[ \overline{LM} \quad \overline{MN} = \quad \]

62. \[ \overline{XZ} = \quad \overline{YX} = \quad \]

63. \[ \overline{RT} = \quad \overline{LM} = \quad \overline{FG} = \quad \]

Use the pictures to match two PAIRS of congruent segments. Use the correct notation to write a congruence statement.

64. Congruence statement pairs:

\[ \overline{AB} \cong \overline{EF} \]

Given the picture, state the measure of each angle or write the measure in the proper location on the diagram.

65. \[ m\angle PRT = \quad m\angle TRS = \quad \]

66. \[ m\angle VEZ = \quad m\angle REU = \quad m\angle VEU = \quad \]

67. \[ m\angle YXZ = 10^\circ \quad m\angle WXY = 50^\circ \quad m\angle WXZ = 60^\circ \quad \]

68. \[ m\angle 1 = 110^\circ \quad m\angle 2 = 70^\circ \quad m\angle 3 = 110^\circ \quad m\angle 4 = 70^\circ \quad \]

Find the measure of each angle using addition or subtraction.

69. \[ m\angle RST = \quad m\angle PST = 30^\circ \quad \]

70. \[ m\angle ABD = 120^\circ \quad m\angle ABC = 35^\circ \quad m\angle CDB = \quad \]

71. \[ m\angle TOS = 150^\circ \quad m\angle TOR = \quad m\angle SOR = \quad \]

72. \[ m\angle EFG = \quad m\angle HFG = \quad \]

73. \[ m\angle PQR = 23^\circ \quad m\angle PQS = \quad m\angle RQS = \quad \]

74. \[ m\angle PQS = \quad m\angle PQR = \quad \]
Write an ALGEBRAIC EXPRESSION for the given angle.

75. \( m\angle ADC = \) __________

76. \( m\angle NRQ = \) __________

Write an ALGEBRAIC EQUATION for the given angle and solve.

77. \( m\angle KLM = \) __________

Equation: ____________________________

78. \( m\angle VRS = \) __________

Equation: ____________________________

\( x = \) ________

\( m\angle KLN = \) ________ \( m\angle NLM = \) ________

\( m\angle VRT = \) ________ \( m\angle TRS = \) ________

81. What is the intersection of plane \( HGY \) and plane \( HFX \)?

\( \text{A} \) Intersection line \( \overline{GH} \)

\( \text{B} \) Plane \( HGF \)

\( \text{C} \) Point \( H \)

\( \text{D} \) Plane \( EGH \)

82. Which statement about the figure is true?

\( \text{A} \) Lines \( x \) and \( y \) intersect at point \( A \).

\( \text{B} \) Points \( A \), \( B \), and \( C \) are collinear.

\( \text{C} \) \( \overrightarrow{EC} \) and \( \overrightarrow{ED} \) are opposite rays.

\( \text{D} \) Another name for \( \overrightarrow{AE} \) is \( \overrightarrow{AB} \).

83. Name three points that are collinear.

\( \text{A} \) \( G \), \( H \), and \( I \)

\( \text{B} \) \( H \), \( G \), and \( J \)

\( \text{C} \) \( F \), \( G \), and \( I \)

\( \text{D} \) \( G \), \( J \), and \( I \)

84. What is the length of \( \overrightarrow{XZ} \)?

\( \text{A} \) 3

\( \text{B} \) 12

\( \text{C} \) 24

\( \text{D} \) 25

\( \text{E} \) 114

85. Which line is not drawn?

\( \text{A} \) \( \overrightarrow{AE} \)

\( \text{B} \) \( \overrightarrow{EC} \)

\( \text{C} \) \( \overrightarrow{BD} \)

\( \text{D} \) \( \overrightarrow{CD} \)

\( \text{E} \) \( \overrightarrow{AC} \)

86. Which points are collinear?

\( \text{A} \) \( A \), \( E \), \( C \)

\( \text{B} \) \( F \), \( D \), \( E \)

\( \text{C} \) \( A \), \( E \), \( D \)

\( \text{D} \) \( D \), \( E \), \( C \)

\( \text{E} \) \( G \), \( B \), \( E \)

87. What is the intersection of \( \overrightarrow{AC} \) and \( \overrightarrow{BD} \)?

\( \text{A} \) \( \overrightarrow{AC} \)

\( \text{B} \) \( \overrightarrow{EC} \)

\( \text{C} \) \( D \)

\( \text{D} \) \( \overrightarrow{BD} \)

\( \text{E} \) \( E \)
Fill in the blank with the missing term.

1. Two angles that add up to 180°. ______________
2. Ray that divides an angle into two congruent angles. ______________
3. A segment, line, ray or plane that intersects a segment at its midpoint. ______________
4. The point right in the middle of a segment. ______________
5. Two angles that add up to 90°. ______________
6. Two angles that make a straight line. ______________
7. Angles next to each other that share a common side and vertex. ______________
8. Angles across from each other that are always equal. ______________
9. When a conclusion is reached based on FACTS. ______________
10. When a conclusion is reached based on a PATTERN. ______________

11. Draw the midpoint of \( \overline{AB} \) and label it \( X \), then name the resulting congruent segments.

![Diagram of AB with midpoint X](image1)

The congruent segments are: ______________
A segment has ____ midpoint(s).

12. M is the midpoint of \( \overline{JK} \). Write an equation, solve for \( x \), and find the indicated lengths.

![Diagram of JK with midpoint M](image2)

\( x = \) __________  \( JM = \) __________  \( MK = \) __________

13. Use the **Midpoint Formula** to find the coordinate of the midpoint. \((-7, 5)\) and \((5, 3)\)

**Midpoint:** \( (\_\_, \_) \)

14. Draw and label three **bisectors** of this segment.

![Diagram of bisectors](image3)

A segment has ____ bisectors

15. Notice the bisector and corresponding tick marks. Find the indicated lengths.

![Diagram of bisected angle](image4)

\( CB = \) __________  \( AB = \) __________

16. Notice the bisector and corresponding tick marks. Find the indicated lengths. \( AC = 150 \) yards

![Diagram of bisected angle](image5)

\( AB = \) __________  \( BC = \) __________

17. Name the **bisector** of this angle. __________
Name the **congruent** angles: __________

18. \( \overline{BD} \) bisects \( \angle ABC \)

\( m\angle 1 = 56^\circ \)
\( m\angle 2 = \) __________
\( m\angle ABC = \) __________

19. \( \overline{YA} \) bisects \( \angle XYZ \)

\( m\angle XYZ = 56^\circ \)
\( m\angle 1 = \) __________
\( m\angle 2 = \) __________

20. Given that \( \overline{BD} \) is the bisector of \( \angle ABC \), write an **ALGEBRAIC EQUATION** and solve.

![Diagram of bisected angle](image6)

\( Y = \) __________  \( m\angle ABD = \) __________  \( m\angle ABC = \) __________

21. Given that \( \overline{WZ} \) is the bisector of \( \angle XWY \), write an **ALGEBRAIC EQUATION** and solve.

![Diagram of bisected angle](image7)

\( x = \) __________  \( m\angle XWZ = \) __________  \( m\angle ZWY = \) __________

22. Name the **adjacent angles** in this picture.

![Diagram of adjacent angles](image8)

Adjacent angles: __________

23. \( 15^\circ \)
Complement: __________
Supplement: __________

24. \( 172^\circ \)
Complement: __________
Supplement: __________

25. These angles add up to ____ \( m\angle 1 = \) __________

26. These angles add up to ____ \( m\angle 1 = \) __________

27. These angles are ____ \( m\angle 1 = \) __________

28. __________
\( m\angle 1 = \) __________  \( m\angle 2 = \) __________  \( m\angle 3 = \) __________

29. \( m\angle 1 = \) __________  \( m\angle 2 = \) __________
\( m\angle 3 = \) __________  \( m\angle 4 = \) __________

### Terms:
- Complementary Angles
- Supplementary Angles
- Midpoint
- Adjacent Angles
- Segment Bisector
- Angle Bisector
- Linear Pair
- Vertical Angles
- Inductive Reasoning
- Deductive Reasoning
30. \( \angle 1 = \) _____ \( \angle 2 = \) _____
\( \angle 3 = \) _____ \( \angle 4 = \) _____

31. Determine whether the angles are vertical, complementary, supplementary or none of these.
- \( \angle 4 \) and \( \angle 5 \)
- \( \angle 2 \) and \( \angle 4 \)
- \( \angle 3 \) and \( \angle 4 \)
- \( \angle 1 \) and \( \angle 3 \)

Given the picture, write an ALGEBRAIC EQUATION and solve for \( x \). 

32. These angles add up to _____
Equation: 
\( x = \) _____
\( \angle ABD = \) _____ \( \angle DBC = \) _____

33. These angles add are_____
Equation: 
\( x = \) _____

34. These angles add up to _____
Equation: 
\( x = \) _____

Underline the hypothesis once, and circle the conclusion.

35. If I pass my driver’s test, then I will get my license.

36. If this is Homecoming Week, then there will be an assembly on Friday.

Decide whether this is an example of inductive or deductive reasoning.

37. The sun is a star, the sun has planets; therefore some stars have planets.

38. There has been a float party every night this week, therefore tonight will be a float party.

Give a counterexample to show that each statement is false.

39. All GP students are sophomores. _______________________________________________

40. All quadrilaterals are rectangles. ___________________________________

Write next three numbers in the pattern

41. -5, -1, 3, 7, _____, _____, _____

42. 2, 3, 5, 8, 12, _____, _____, _____

43. Conditional: If a quadrilateral has four right angles, then it is a rectangle.
   Converse: ________________________________ True or False
   Inverse: ________________________________ True or False
   Contrapositive: __________________________ True or False

What can you conclude from the true Statements below?

44. If you wash your cotton t-shirt in hot water, it will shrink. You wash your cotton t-shirt in hot water.
   Therefore, ________________________________

45. If the ball is thrown at a window, it will hit the window. If the ball hits the window, then the window will break.
   Write a single if-then statement that follows from the pair of true statements below.

46. Multiple Choice: What is the next figure in this pattern?
State the following using the picture. Don’t forget to use angle symbols!

1. Four interior angles ________, ________, ________, ________

2. Four exterior angles ________, ________, ________, ________

3. Two pairs of alternate interior angles _______ & _______, and _______ & _______

4. Two pairs of alternate exterior angles _______ & _______ and _______ & _______

5. Four pairs of corresponding angles _______ & _______, _______ & _______, _______ & _______, and _______ & _______

6. Four pairs of vertical angles _______ & _______, _______ & _______, _______ & _______, and _______ & _______

Choose the letter that shows the correct relationship between the angle pairs.

7. \( \angle 3 \) and \( \angle 9 \)  
   8. \( \angle 1 \) and \( \angle 12 \)

9. \( \angle 8 \) and \( \angle 13 \)
   10. \( \angle 2 \) and \( \angle 10 \)

11. \( \angle 5 \) and \( \angle 7 \)
   12. \( \angle 6 \) and \( \angle 16 \)

13. \( \angle 1 \) and \( \angle 2 \)
   14. \( \angle 5 \) and \( \angle 13 \)

15. \( \angle 10 \) and \( \angle 16 \)
   16. \( \angle 13 \) and \( \angle 15 \)

Describe the relationship between the pairs of angles by circling the word that makes the sentence true.

17. If lines are parallel, then the alternate interior angles are: congruent supplementary the corresponding angles are: congruent supplementary the same side interior angles are: congruent supplementary

18. Vertical angles are always congruent supplementary even if the lines are not parallel.

19. Angles that are a linear pair are always congruent supplementary even if the lines are not parallel.

Find the measure of all the angles shown in the picture.

20. \( 50^\circ \)

21. \( 150^\circ \)

22. \( 40^\circ \)

23. \( 80^\circ \)

24. \( 130^\circ \)

25. JKL is a parallelogram

26. This is a trapezoid.

27. \( 42^\circ \)

28. ROCK is a parallelogram

29. STAR is a parallelogram

30. PLAY is a parallelogram

\( \angle 1 \) \( \angle 3 \) \( \angle 4 \) \( \angle 5 \)

\( \angle K \) \( \angle L \) \( \angle H \) \( \angle F \)

\( \angle O \) \( \angle C \)

\( \angle R \) \( \angle A \)

\( \angle S \)

\( \angle 1 \) \( \angle 2 \) \( \angle 3 \)
31. SONG is a parallelogram

\[ \angle1 \quad \angle2 \quad \angle3 \quad \angle4 \]

\[ \angle1 \quad \angle2 \quad \angle3 \quad \angle4 \]

State the type of angles shown and find the measure of \( \angle1 \).

34. 
35. 
36. 
37. 
38.

Type of angles ________
Type of angles ________
Type of angles ________
Type of angles ________
Type of angles ________

Use the relationship between the angles given to write an equation and solve for \( x \).

39. 
40. 
41.

Type of angles __________
Type of angles __________
Type of angles __________

Relationship: congruent or supplementary
Relationship: congruent or supplementary
Relationship: congruent or supplementary
Equation: __________
Equation: __________
Equation: __________

\[ x = \_\_\_\_\_\_ \]

42. 
43. 
44.

Relationship: congruent or supplementary
Relationship: congruent or supplementary
Relationship: complementary or supplementary
Equation: __________
Equation: __________
Equation: __________

\[ x = \_\_\_\_\_\_ \]

45. The SYMBOL for Parallel is: __________
The SYMBOL for Perpendicular is __________

Determine whether enough information is given to conclude that the lines are parallel. If so, state the reason. Choices are:

- Alternate Interior Angles Converse (AIA)
- Alternate Exterior Angles Converse (AEA)
- Same-Side Interior Angles Converse (SSI)
- Corresponding Angles Converse (CA)
- Not enough proof that the lines are parallel.

46. 
47. 
48. 
49. 
50.
Circle the segments or lines that must be parallel.

51. \( \overrightarrow{SW} \parallel \overrightarrow{MI} \) or \( \overrightarrow{SM} \parallel \overrightarrow{WI} \)

52. \( \overrightarrow{IH} \parallel \overrightarrow{FG} \) or \( \overrightarrow{FI} \parallel \overrightarrow{GH} \)

53. \( m \parallel n \) or \( x \parallel y \)

Fill in the blank with PARALLEL, PERPENDICULAR, or INTERSECTING to make each statement true.

54. Line \( q \) is \__________\, to line \( r \)

55. Line \( p \) is \__________\, to line \( r \)

56. Line \( p \) is \__________\, to line \( q \)

57. Line \( p \) is \__________\, to line \( s \)

Consider each segment in the diagram at the right as part of a line. Complete the statement.

58. Name three segments \( \text{parallel to} \overrightarrow{TZ} \). \__________\, \__________\, \__________\.

59. Name four segments that \( \text{intersect} \overrightarrow{TZ} \). \__________\, \__________\, \__________\, \__________\.

60. Name four segments \( \text{skew to} \overrightarrow{TZ} \). \__________\, \__________\, \__________\, \__________\.

Complete the theorems about parallel, perpendicular and skew lines.

61. All \( \text{right angles are} \) \__________\.

62. If two lines are \( \text{perpendicular} \), then they intersect to form four \__________\.

63. Two lines are parallel lines if they lie in the same plane and do not \__________\.

64. Two lines are \( \text{perpendicular} \) lines if they intersect to form a \__________\, angle.

65. Two lines are skew lines if they do not lie in the same \__________\, and do not intersect.

66. Two planes are \__________\, planes if they do not intersect.

67. Draw a segment through \( Z \) \( \text{parallel to} \overrightarrow{JK} \). \__________\.

68. Draw a segment through \( Z \) \( \text{perpendicular to} \overrightarrow{JK} \). \__________\.

Fill in the blank with a number.

69. \( \text{Parallel Postulate} \) if there is a line and a point not on the line, then there is exactly \__________\ line through the point parallel to the given line.

70. \( \text{Perpendicular Postulate} \) if there is a line and a point not on the line, then there is exactly \__________\ line through the point perpendicular to the given line.

Describe the relationship between the lines shown. \( \text{(intersecting, parallel, skew)} \)

71. lines \( w \) and \( k \)

72. lines \( j \) and \( k \)

73. lines \( m \) and \( k \)

74. lines \( u \) and \( w \)

75. lines \( m \) and \( n \)
Geometry Chapter 4 Review

MATCH each type of triangle with its definition.

<table>
<thead>
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<th>Equilateral Triangle _____</th>
<th>Equiangular Triangle _____</th>
<th>A. Triangle with one right angle.</th>
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<tbody>
<tr>
<td>Isosceles Triangle _____</td>
<td>Acute Triangle _____</td>
<td>B. Triangle with all (3) equal sides.</td>
</tr>
<tr>
<td>Scalene Triangle _____</td>
<td>Right Triangle _____</td>
<td>C. Triangle with all (3) equal angles.</td>
</tr>
<tr>
<td></td>
<td>Oblique Triangle _____</td>
<td>D. Triangle with three acute angles.</td>
</tr>
</tbody>
</table>

Classify the triangle by its sides.

1. ________________
2. ________________
3. ________________
4. ________________

Classify the triangle by its angles.

5. ________________
6. ________________
7. ________________
8. ________________

Classify the triangle by its angles AND sides.

9. Sides: equilateral isosceles scalene
   Angles: acute obtuse equiangular right

10. Sides: equilateral isosceles scalene
    Angles: acute obtuse equiangular right

11. Sides: equilateral isosceles scalene
    Angles: acute obtuse equiangular right

12. Sides: equilateral isosceles scalene
    Angles: acute obtuse equiangular right

Identify the side opposite each angle.

Use the picture to name the following.

Name the equal sides and equal angles in each picture.

Using △ABC, name the following.

17. The interior angles of this triangle are _____________. The sum of the interior angles is _____ degrees.
18. The exterior angle of this triangle is _____ The adjacent interior angle (next to the exterior angle) is _____
19. The exterior and the adjacent interior angle add up to _____ degrees. The remote interior angles shown are ____________
20. The sum of the remote interior angles is equal to __________________

Find the measure of each angle.

21. m∠1 = _____
22. m∠1 = _____
23. m∠1 = _____
24. m∠1 = _____ m∠2 = _____
   Each angle in an equiangular triangle is ___ degrees.  m∠3 = _____

25. m∠1 = _____ m∠2 = _____
26. m∠1 = _____
27. m∠1 = _____
28. m∠1 = _____ m∠2 = _____  
   m∠3 = _____ m∠4 = _____ m∠5 = _____
29. \( x = \) 
30. \( x = \) 
31. \( m\angle 1 = \) \( m\angle 2 = \)
32. \( m\angle 1 = \) \( m\angle 2 = \)
33. \( m\angle 8 = \) \( m\angle 9 = \)
34. \( m\angle 3 = \) \( m\angle 4 = \)
35. \( m\angle 2 = \) \( m\angle 1 = \)
36. \( m\angle 1 = \) \( m\angle 2 = \)

Write an algebraic equation for each triangle and solve for \( x \).

37. 
38. 
39. 

Equation: 
Equation: 
Equation: 

\( x = \) 
\( x = \) 
\( x = \) 

\( y = \) 
\( x = \) 
\( x = \) 

\( x \approx \) 
\( x \approx \) 
\( x \approx \) 

✓ State the **Pythagorean Theorem**: ____________________ What is it used for? ____________________

Use the Pythagorean Theorem to find the following missing side. An equation must be given! Round decimals to the nearest 100th.

43. 
44. 
45. 

Equation: 
Equation: 
Equation: 

\( x = \) 
\( x = \) 
\( x = \) 

\( x = \) 
\( x = \) 
\( x = \) 

\( x = \) 
\( x = \) 
\( x = \) 

\( x = \) 
\( x = \) 
\( x = \) 

\( x = \) 
\( x = \) 
\( x = \) 

\( x = \) 
\( x = \) 
\( x = \)
49. A 20-foot ladder is leaning against a wall. It reaches up the wall 16 feet. How far is the bottom of the ladder from the wall?

Equation:

50. A 26-ft wire is attached to an electrical pole. The wire attaches to a stake on the ground. If the stake is 10 feet from the base of the pole. How tall is the pole?

Equation:

51. Find the length of the diagonal of a square if each side 10

Equation:

52. Mary hikes 7 km north and 5 km west. How far is she from her starting point?

Equation:

Can the given side lengths make a right triangle. Circle yes or no. You MUST support your answer with an equation!

53. 4 ft, 9 ft, 7 ft

54. 10 in., 26 in., 24 in.

55. 20 cm, 16 cm, 12 cm

56. 20 in., 28 in., 21 in.

Equation:
Equation:
Equation:
Equation:

yes or no  yes or no  yes or no  yes or no

Given the Pythagorean Triple, state THREE OTHER MULTIPLES that are also Pythagorean Triples.

57. 3, 4, 5

58. 5, 12, 13

59. 8, 15, 17

Find the DISTANCE between the two points. Round your answers to the nearest 100th, if necessary.

60. (-2, 1) and (3, 2)

\[d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}\]

61. (-1, 2) and (3, 0)
Matching:
64. A segment from a vertex to the **midpoint** of the opposite side ______
65. A segment from a vertex **perpendicular** to the opposite side ______
66. A segment from a vertex that **bisects** the corner angle ______
67. Cuts a segment in half **and** makes a 90° angle ______

**BD** is a **MEDIAN** of **ABC**. Find each length.
68. ______
69. ______
70. ______

71. The **medians** on this picture are segments: ____________________________

Draw and label the **MEDIAN** from vertex **X**.
72. ______
73. ______

Fill in the blank.
74. If a point is on the **angle bisector**, then it is __________________________ from the two sides of the angle.

Write an equation and solve for **x**.
75. Equation: $\frac{10x+10}{8x+20}$
76. Equation: $\frac{4x+3}{8x-9}$
77. Equation: $\frac{6x-17}{3x+7}$

$x = _____$
$x = _____$  $PS = _____$  $RS = _____$
$x = _____$  $PM = _____$  $MN = _____$

78. If a point is on the **perpendicular bisector** of a segment, then it is __________________________ from the endpoints of the segment.

Write an equation and solve for **x**.
79. Equation: $\frac{10x-4}{4x+14}$
80. Equation: $\frac{3x+8}{7x-16}$
81. Equation: $\frac{5x-20}{2x+4}$

$x = _____$  $BC = _____$  $DC = _____$
$x = _____$  $AB = _____$  $CB = _____$
$x = _____$  $AD = _____$  $CD = _____$
Write an equation and solve for \( x \).

82. \[ \text{Equation: } \]

83. \[ \text{Equation: } \]

\[ x = \] \[ x = \]

Fill in the blanks:

_____ sides are across from BIG angles, _____ sides are across from LITTLE angles and _____ sides are across form EQUAL angles.

List the ANGLES in each triangle from smallest to largest.

84. ________

85. ________

List the SIDES of each triangle from shortest to longest.

86. ________

87. ________

88. Triangle Inequality Theorem: The sum of any two sides of a triangle must be ...

Can the following side lengths make a triangle? Circle yes or no. Explain all answers!

89. 1 cm, 2 cm, 3 cm ____________ yes or no

90. 2 mm, 3 mm, 4 mm ____________ yes or no

91. 8 cm, 8 cm, 8 cm ____________ yes or no

92. 9 mm, 9 mm, 18 mm ____________ yes or no

93. 21 m, 4 m, 13 m ____________ yes or no

94. 50 cm, 50 cm, 25 cm ____________ yes or no

95. Draw and label the ANGLE BISECTOR of \( X \).

96. Draw and label the PERPENDICULAR BISECTOR of \( AB \).

97. What is the length of \( LK \)?

[A] 4 \hspace{1cm} [B] 13 \hspace{1cm} [C] 18

[D] 19 \hspace{1cm} [E] 26

98. What is the length of \( JK \)?

[A] 6 \hspace{1cm} [B] 13 \hspace{1cm} [C] 18

[D] 26 \hspace{1cm} [E] 36
1. What does it mean for two triangles to be congruent? ________________________________

Study the picture to name all the pairs of corresponding sides and angles. Order of the letters matters!

2. Pairs of Corresponding Sides  Pairs of Corresponding Angles
   \( CD \cong \quad \angle C \cong \quad \)
   \( EC \cong \quad \angle D \cong \quad \)
   \( DE \cong \quad \angle E \cong \quad \)
   Congruence Statement: \( \triangle ECD \cong \triangle \quad \)

3. Pairs of Corresponding Sides  Pairs of Corresponding Angles
   \( XZ \cong \quad \angle X \cong \quad \)
   \( YX \cong \quad \angle Y \cong \quad \)
   \( ZY \cong \quad \angle Z \cong \quad \)
   Congruence Statement: \( \triangle ZXY \cong \triangle \quad \)

4. Mark each pair of corresponding angles and corresponding sides to show the congruent parts.

5. CPCTC stands for: ___________________ Parts of ___________________ Triangles are ________________.

Given \( \triangle ABC \cong \triangle DEF \), find the missing length or angle measure.

6. \( DE = \quad BC = \quad AC = \quad \)
   \( m\angle B = \quad m\angle F = \quad m\angle A = \quad \)
   \( m\angle C = \quad m\angle D = \quad m\angle E = \quad \)

Mark the triangles to correspond to each postulate:


Name the postulate which could be used to show the triangles are congruent. Don’t forget to mark “free” sides and angles! Fill in the congruence statement where indicated. Choices are: SSS, SAS, ASA, AAS, H-L or none.

14. Postulate ________  \( \triangle MON \cong \triangle \quad \)
15. Postulate ________  \( \triangle PQR \cong \triangle \quad \)
16. Postulate ________  \( \triangle LJK \cong \triangle \quad \)
17. Postulate ________  \( \triangle FED \cong \triangle \quad \)
18. Postulate ________  \( \triangle STR \cong \triangle \quad \)
19. Postulate ________  \( \triangle ZYX \cong \triangle \quad \)
20. Postulate ________  \( \triangle ADC \cong \triangle \quad \)
21. Postulate ________  \( \triangle ACD \cong \triangle \quad \)
22. Postulate ________  \( \triangle ABC \cong \triangle \quad \)
23. Postulate ________  \( \triangle PQR \cong \triangle \quad \)
24. Postulate ________  \( \triangle KJM \cong \triangle \quad \)
25. Postulate ________  \( \triangle AUHS \cong \triangle \quad \)

Hint: How many degrees are in a triangle?
Mark the pictures first and then state what postulate proves the triangles congruent. Choices: SSS, SAS, ASA, AAS, H-L or none.

26. $\overline{AB} \cong \overline{MN}; \angle A \cong \angle M$
   
   Postulate ______

27. $\overline{AB} \cong \overline{MN}; \angle A \cong \angle M$
   
   Postulate ______

28. $\overline{AB} \cong \overline{MN}; \overline{AC} \cong \overline{MO}$
   
   Postulate ______

29. $\overline{AB} \cong \overline{MN}; \overline{BC} \cong \overline{NO}$
   
   Postulate ______

Using the given information and method, state the PAIRS of additional information needed to prove the triangles congruent.

30. $\overline{BC} \cong \overline{YZ}; \angle C \cong \angle Z$ AAS Postulate
   
   Pair of sides or angles needed __________________________

31. $\overline{BC} \cong \overline{YZ}; \angle C \cong \angle Z$ SAS Postulate
   
   Pair of sides or angles needed __________________________

32. $\overline{BC} \cong \overline{YZ}; \angle C \cong \angle Z$ ASA Postulate
   
   Pair of sides or angles needed __________________________

33. $\overline{BC} \cong \overline{EC};$ SAS Postulate (hint: Mark "free" angles)
   
   Pair of sides or angles needed __________________________

34. $\overline{AC} \cong \overline{XZ}$ ASA Postulate
   
   Pair of sides or angles needed __________________________

35. $\overline{AC} \cong \overline{XZ}$ SSS Postulate
   
   Pair of sides or angles needed __________________________

36. $\overline{AB} \cong \overline{XY}$ SAS Postulate (TWO solutions)
   (Hint: Mark given sides… each solution has a pair of sides and a pair of angles.)

   ONE WAY:
   
   Pairs of sides needed __________________________
   
   Pairs of angles needed __________________________

   OR

   THE "OTHER WAY”:
   
   Pairs of sides needed __________________________
   
   Pairs of angles needed __________________________

37. $\overline{AB} \cong \overline{XY}$ AAS Postulate (TWO solutions)
   (Hint: Mark given angles… each solution has a pair of sides and a pair of angles.)

   ONE WAY:
   
   Pairs of angles needed __________________________
   
   Pairs of angles needed __________________________

   OR

   THE "OTHER WAY”:
   
   Pairs of angles needed __________________________
   
   Pairs of angles needed __________________________

Is the segment a LEG or the HYPOTENUSE?

38. $\overline{FE}$ ______

39. $\overline{FD}$ ______

40. $\overline{DE}$ ______

Name the ANGLE that is included between the two sides.

41. $\overline{CD}$ and $\overline{BC}$ ______

42. $\overline{AB}$ and $\overline{CB}$ ______

43. $\overline{DC}$ and $\overline{BD}$ ______

44. $\overline{AB}$ and $\overline{BD}$ ______
For each of the following shapes, state the definition, draw a picture, and choose the letter that corresponds to the properties.

**Parallelogram**
Definition: _________________________________________
Picture:
Properties: 1. _____ 2. _____ 3. _____ 4. _____

**Rhombus**
Definition: _________________________________________
Picture:
Properties: 1. _____ 2. _____ 3. _____ 4. _____
5. _____ 6. _____

**Rectangle**
Definition: _________________________________________
Picture:
Properties: 1. _____ 2. _____ 3. _____ 4. _____
5. _____

**Square**
Definition: _________________________________________
Picture:
Properties: 1. _____ 2. _____ 3. _____ 4. _____
5. _____ 6. _____ 7. _____

**Trapezoid**
Definition: _________________________________________
Picture:

An **isosceles** trapezoid has _________________________
The **base angles** of an **isosceles** trapezoid are
________________

To find the length of the **midsegment**, you _____ the bases together and divide by _____.

**Answer true or false.**
1. Every **rectangle** is a **square** __________________
2. Every **square** is a **rectangle** __________________
3. Every **parallelogram** is a **rhombus**___________
4. Every **rhombus** is a **rectangle** ______________
5. Every **square** is a **quadrilateral** _____________
6. Every **square** is a **rhombus** _______________
7. The diagonals of a **rectangle** are **perpendicular** __________
8. The diagonals of a **square** are **perpendicular**
9. The diagonals of a **rectangle** are **congruent** __________
10. The diagonals of a **rhombus** are **congruent**
11. The opposite sides of a **parallelogram** are **congruent**
12. The opposite angles of a **parallelogram** are **supplementary**
13. The diagonals of all **parallelograms** bisect each other
14. The diagonals of all **parallelograms** are **congruent**

**Name the following segments or angles in the trapezoid. Use the correct notation!**
15. Two **Bases**: _________
16. Two **Legs**: _________
17. **Midsegment**: _________
18. Two pairs of **Base Angles**: _______ & _______
For each PARALLELOGRAM, find each length or measure.

19.  

\[ \angle C \]  \[ \angle B \]  

\[ BC = \]  \[ DC = \]  

20.  

\[ \angle 1 \]  \[ \angle 2 \]  

21.  

\[ XO = \]  \[ XZ = \]  

For each RHOMBUS, find each length or measure.

22.  

\[ \angle C \]  \[ \angle B \]  

\[ BC = \]  \[ DC = \]  

23.  

\[ \angle 1 \]  \[ \angle 2 \]  

24.  

\[ \angle 1 \]  \[ \angle 2 \]  

For each RECTANGLE, find each length or measure.

25.  

\[ \angle 1 \]  \[ \angle 2 \]  

\[ BC = \]  \[ DC = \]  

26.  

\[ \angle 1 \]  \[ \angle 2 \]  

27.  

\[ \angle 1 \]  \[ \angle 2 \]  

For each SQUARE, find each length or measure.

28.  

\[ \angle 1 \]  \[ \angle 2 \]  

\[ BC = \]  \[ DC = \]  

29.  

\[ \angle 1 \]  \[ \angle 2 \]  

30.  

\[ \angle 1 \]  \[ \angle 2 \]  

For each TRAPEZOID, find each length or angle measure

31.  

\[ \angle R \]  \[ \angle T \]  

\[ \angle P \]  \[ \angle S \]  

\[ \angle A \]  \[ PA = \]  

32.  

\[ \angle 1 \]  \[ \angle 2 \]  

\[ \angle 3 \]  \[ \angle 4 \]  

\[ y = \]  

33.  

\[ \angle 1 \]  

\[ \angle 2 \]  

\[ \angle 3 \]  \[ \angle 4 \]  

Name all the quadrilaterals that have each property. Choices: parallelogram, rhombus, rectangle, square.

There will be more than one answer!

34. All angles congruent  

35. Opposite angles are congruent  

36. The diagonals are perpendicular  

37. The diagonals bisect each other  

Using the properties of each shape to write and solve an algebraic equation for each picture.

### Parallelogram

38. \( (2x+20)^\circ \)

Equation:

\[ x = \ldots \]

\[ m\angle ABC = \ldots \]

\[ m\angle BCD = \ldots \]

### Rhombus

39. \( (3x+10)^\circ \)

Equation:

\[ x = \ldots \]

### Rectangle

40. \( (\frac{x+5}{2})^\circ \)

Equation:

\[ x = \ldots \]

### Square

41. \( (2x+30)^\circ \)

Equation:

\[ x = \ldots \]

### Trapezoid

42. \( (10x)^\circ \)

Equation:

\[ x = \ldots \]

### Isosceles Trapezoid

43. \( (x+30)^\circ \) \( (4x)^\circ \)

Equation:

\[ x = \ldots \]

### Match the name of each polygon with the number of sides.

| 44. Decagon | 45. Octagon | A. 3 sides |
| 46. Quadrilateral | 47. Hexagon | B. 4 sides |
| 48. Nonagon | 49. Pentagon | C. 5 sides |
| 50. Heptagon | 51. Triangle | D. 6 sides |
| 52. | 53. | 54. | 55. | 56. | 57. |

### Classify (Name) the polygon by its number of sides.

52. | 53. | 54. | 55. | 56. | 57. |

### Name the following for the pentagon shown.

58. Two **sides** adjacent to \( RS \) \[ \ldots \]

59. Two **vertices** consecutive to \( T \) \[ \ldots \]

60. Two **angles** consecutive to \( \angle T \) \[ \ldots \]

61. Two **diagonals** with endpoint \( R \) \[ \ldots \]

66. The sum of the angles of a **Triangle** is \[ \ldots \]

67. The sum of the angles of a **Quadrilateral** is \[ \ldots \]

### Use the formulas to find the measure of the missing angle.

62. | 63. | 64. | 65. |

\[ m\angle 1 = \ldots \]

\[ m\angle 1 = \ldots \]

\[ m\angle D = \ldots \]

\[ m\angle D = \ldots \]