Geometry College Prep Midterm Exam Review

The midterm exam will cover the chapters and sections listed below. The exam will be worth 20% of your semester grade. The exam grade can impact your semester grade significantly, positively or negatively. It is up to you to prepare for the exam. We will review in class on Midterm Exam Review Day, and possibly a class before that as well. You are welcome to come work with me before school, after school, during resource, or during Math Study Hall before the exam. Your midterm exam will consist of both multiple choice and free response problems.

WHAT CAN YOU DO TO PREPARE FOR THE EXAM?

1. Gather all your tests and quizzes from the first semester. Look over each of them and practice the problems, especially the ones that you got wrong.
2. Reprint worksheets posted in OnCampus and work on the problems that you had difficulties with. Compare your new answers to the ones we discussed in class.
3. Starting now, set aside 15 minutes a day to work on reviewing for this exam!
4. Get together with a friend and work on problems.
5. Study your formulas, postulates, theorems, and vocabulary.
   a. Use your flashcards!
6. Each chapter in the textbook has:
   a. Mixed Review Exercises at the end of each section
   b. Chapter Wrap-up broken down by section at the end of the chapter
   c. Chapter Tests at the end of each chapter
   d. Cumulative Review to cover all previous chapters at the end of each chapter
7. I am attaching some additional problems to help get you started.
8. This review packet should not serve as your only means of review!!

I am not expecting you to complete every single problem attached and listed above. I am expecting you to complete a smattering of problems from each main topic to review all concepts and highlight the areas for yourself where you need to spend some extra energy studying.

This review of sample problems below is for the Geometry College Prep course. The purpose of the information is to guide you to the topics you should be reviewing. The depth of what we covered and how much we covered in each level for each topic should be found in your notes. Below is a list of sections covered from the book. Anything listed in red will potentially be covered after Thanksgiving Break.

Chapter and Sections Covered
Chapter 1 Sections 1.3 – 1.6 and 1.8-1.9     Chapter 2 Sections 2.4 – 2.5
Chapter 3 Sections 3.1 – 3.7                  Chapter 4 Sections 4.1 – 4.7
Chapter 5 Sections 5.1 – 5.3 and 5.5
Use the figure to the right for questions 1-5. Be sure to read each statement and identify what you are being told to do before answering!

1. Name three noncollinear points.
2. Identify two lines that are parallel to each other.
3. Name two lines that are skew to \( \overline{DH} \).
4. Name three lines that intersect at \( C \).
5. Identify a pair of parallel planes.

On a number line, the coordinates of \( A, B, C, D, E, \) and \( F \) are \(-30, -20, -13, -5, 12, \) and 22. Use this information to answer the following questions:

6. What is the length of \( \overline{AB} \)?
7. What is the length of \( \overline{BC} \)?
8. What is the length of \( \overline{CD} \)?
9. What is the length of \( \overline{DE} \)?
10. What is the length of \( \overline{EF} \)?
11. What is the length of \( \overline{AD} \)?
12. Is \( \overline{AC} \cong \overline{DF} \)?
13. Is \( \overline{AB} \cong \overline{EF} \)?

Use the figure to the right for the following questions:

14. If \( AB = 21 \) and \( AC = 112 \), then \( BC = \) _____.
15. If \( AB = 40 \) and \( BC = 78 \), then \( AC = \) _____.
16. If \( AB = 2x + 5 \), \( BC = 5x + 23 \), and \( AC = 119 \), find the value of \( x \). Then find \( AB \) and \( BC \).
If $m\angle ABD = 100^\circ$, find the value of $x$. Then find $m\angle ABC$ and $m\angle CBD$.

17.

Use the figure to the right to find the measure of each of the following angles.

18. $w^\circ$
19. $x^\circ$
20. $y^\circ$
21. $z^\circ$

Use the figure to the right to identify each type of angle pair. Be sure to properly name each angle using the points that are given.

22. Complementary Angles
23. Supplementary Angles
24. Vertical Angles

Find the distance between the following points.

25. $A(-2, 3) B(3, -9)$
26. $C(2, -3) D(5, 1)$

Find the coordinates of the midpoint of each segment. The coordinates of the endpoints are given.

27. $G(-8, -9) H(0, -3)$
28. $U(6, 2) V(2, 10)$
Find the coordinates of the endpoint \( B \) using the given information.

29. The coordinates of \( A \) are \((-5, 7)\), and the midpoint of \( \overline{AB} \) is \((-2, 2)\)

Find the perimeter and area of the rectangles with the given height and base.

30. base: 11 m  
   height: 13 m

31. base: 17 m  
   height: 21 m

Find the area and circumference of the circles using the given information. Simplify answers to the nearest tenth.

32. \[ \text{radius: } 5 \text{ m} \]

33. \[ \text{radius: } 50 \text{ cm} \]

Find the area and perimeter of the squares using the given information.

34. \[ \text{side: } 25 \text{ ft} \]

35. \[ \text{side: } 7 \text{ ft} \]
Find the perimeter and area of the figure below using the given information.

36. [Diagram of a figure with dimensions 4, 10, 2, 12, 2, 6]

List of Properties
- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Reflexive Property of Equality
- Symmetric Property of Equality
- Transitive Property of Equality
- Substitution Property of Equality
- Distributive Property of Equality
- Reflexive Property of Congruence
- Symmetric Property of Congruence
- Transitive Property of Congruence

Using the list above, fill in the reason that justifies each step.

37. \( m\angle LKM = m\angle MKJ \)  
   Given
   
   \[
   3x - 1 = 2x + 10 \\
   x - 1 = 10 \\
   x = 11
   \]
38. **Given:** \( AC = 74 \)

\[
AB + BC = AC \quad \text{Segment Addition Postulate}
\]

\[
(2x + 5) + (3x - 1) = 74
\]

Combine like terms

\[
5x + 4 = 74
\]

\[
5x = 70
\]

\[
x = 14
\]

39. \( 7(6x + 12) = 420 \)

Given

\[
42x + 84 = 420
\]

\[
42x = 336
\]

\[
x = 8
\]

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Use the given property to complete each statement.

40. **Transitive Property of Congruence**

If \( \overline{DC} \cong \overline{UV} \) and \( \overline{UV} \cong \overline{JK} \), then \( \overline{DC} \cong \) __________

41. **Distributive Property of Equality**

\[ 26x + 91 = 13 \cdot (\text{__________}) \]

42. **Multiplication Property of Equality**

If \( \frac{9}{13}t = 7 \), then \( 9t = \) __________

43. **Symmetric Property of Congruency**

If \( \angle D \cong \angle H \), then \( \angle H \cong \) __________
Find the value of $x$.

First, identify the angle pair as same-side interior angles, same-side exterior angles, alternate interior angles, alternate exterior angles, or corresponding angles.

Second, solve for $x$.

Third, find the measure of each angle.

50.

51.
Find the value of $x$ that makes lines $u$ and $v$ parallel

$a$, $b$, $c$, and $d$ are distinct lines in the same plane. Questions 55–57 show different combinations of relationships between $a$ and $b$, $b$ and $c$, and $c$ and $d$. For each combination of the three relationships, how are $a$ and $d$ related?

55. $a \parallel b$, $b \perp c$, $c \parallel d$  
56. $a \perp b$, $b \parallel c$, $c \perp d$

57. $a \perp b$, $b \perp c$, $c \parallel d$

First, find the value of $x$.

Second, clearly identify the value of all three angles.

Third, use the angle measurements to classify the triangle as a right, obtuse, acute, or equiangular triangle.
Use the given angles to identify the remaining three angles. Make sure that the angles are clearly labeled.

60.

First, find the value of $x$.

Second, find the measure of the angle that is indicated.

61. Find $m \angle S$.

62. Find $m \angle QWV$.

First, determine the sum of the interior angles for each polygon.

Second, state whether the polygon is concave or convex.

63.

64.
Find the measure of one interior and one exterior angle in each regular polygon.

65. \[ \text{ } \]

66. \[ \text{ } \]

Write the point-slope form of the equation of the line through the given points.

67. through: \((3, -4)\) and \((0, -2)\)  

68. through: \((-3, 5)\) and \((0, 1)\)

Write the slope-intercept form of the equation of the line described.

69. through: \((2, -2)\), parallel to \(y = -\frac{5}{2}x - 9\)  

70. through: \((-2, -3)\), perpendicular to \(y = -\frac{2}{3}x - 2\)

First, list all the corresponding sides that are congruent for the following congruent triangle.

Second, list all the corresponding angles that are congruent.

71. \( \triangle HJI \cong \triangle HUV \)
**First,** determine whether the triangles are congruent because of SSS, SAS, ASA, AAS, or HL.

**Second,** complete the congruence statement for the triangles.

**Third,** explain why the given statement is true.

72. Prove: $\overline{WV} \cong \overline{YZ}$

73. Prove: $\angle B \cong \angle D$

74. Prove: $\overline{FG} \cong \overline{HI}$

State what additional information is needed in order to know that the triangles are congruent using the reason given.

75. AAS

76. SSS

Solve for $x$. 

77. $5 = 2x + 19$

78. $x = \frac{38^\circ}{2}$
81. \( m\angle 2 = 2x - 14 \)

82. Given: \( \angle C \cong \angle D \), \( AC \cong AD \)

**Solve** for \( x \).
Each figure shows a triangle with one of its angle bisectors.

85. \( m \angle 2 = 2x + 8 \) and \( m \angle 1 = 4x - 6 \). Find \( m \angle VTU \).

86. Find \( m \angle 1 \) if \( m \angle 2 = -5 + 2x \) and \( m \angle ACB = x + 14 \).

Each figure shows a triangle with its three angle bisectors intersecting at point P.

87. \( PD = 9 \). Find \( PC \).

88. Find \( PS \) if \( PR = 3 \).

Use the figure below to find the length of \( DC \).

89. What is the value of \( x \)?

90.
Solve for $y$.

91.

\[ \begin{align*}
L & \quad 27 \\
K & \quad 9y^\circ \\
H & \quad (5y+8)^\circ
\end{align*} \]

Solve for $y$, $ST$, and $TU$

92.

\[ \begin{align*}
S & \quad 7y \\
T & \quad 4y + 6
\end{align*} \]

Are the following lines concurrent at the circumcenter or incenter of the triangles below?

93.

94.

Each figure shows a triangle with one or more of its medians.

95. Find $WL$ if $LQ = 5.7$

96. Find $AR$ if $TA = 18$

97. Find $UD$ if $AD = 10$
Are the following lines a median or altitude?

98. \(\overline{BD}\)

99. \(\overline{HJ}\)

State if the three numbers can be the measure of the sides of a triangle.

100. 2, 7, 7

101. 21, 12, 8

Two sides of a triangle have the following measures. Find the range of possible measures for the third side.

102. 10, 10

103. 8, 12

List the angles of the triangles in order from smallest to largest.

104.

105.