

Geometry – Test Review (Covering Chapters 1, 2, 3, 5, 7, 9, 10, and some extra stuff)

*This review contains a list of concepts that I will be testing you over. To practice these concepts, I have included practice problems or recommended homework problems that can be found in your book. **You must decide for yourself** which of the problems to do, based on your own understanding of the material. There are far too many problems listed to do them all. Once you get a handle on a particular problem type, move on.*

As you can see by the length of this review, you are beginning to be expected to know a Lot of content. While I sympathize with your complaints about having to memorize so much, it simply can't be helped. My job is to prepare you for the ACT and there's a lot of material on it.

READ THIS SECTION! *To make these tests not seem so overwhelming, I'll allow you the FRONT SIDE ONLY of one sheet of standard 8.5 by 11in. paper to write **any** review material you think will need when taking the test. You can use that review sheet when working on the test. If you'd like recommendations on what to put on your paper I'd be happy to help. You'll be turning these sheets in with your tests.*

Chapter 1 Content:

1. Be able to identify (label), define, and sketch Lines, Rays, and Line Segments
2. Understand, be able to define, and use the definitions of the following terms: Midpoint, Bisector.
3. Use the midpoint formula to find the midpoint between two points.
Given (x_1, y_1) & (x_2, y_2) Midpoint: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
4. Use the distance formula to find the distance between two points.
Given (x_1, y_1) & (x_2, y_2) Distance: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
5. Understand and define Acute, Right, Obtuse and Straight angles.
6. Solve problems of determining angle measures by using previous vocabulary and algebra skills
7. Understand and define Complimentary, Supplementary, Adjacent Angles, Linear Pairs, and Vertical Angles
8. Solve problems of determining angle measures by using previous vocabulary and algebra skills.

Chapter 3 Content:

9. Label, Define, and/or Identify pairs of Corresponding angles, Alternate Exterior angles, Alternate Interior Angles, and Consecutive Interior Angles
10. Determine the slope of a line given a Graph or two points the line crosses
 - o The slope formula will NOT be provided for you. You need to Memorize it.
11. Determine the slope of a line given information regarding a second parallel/perpendicular line.

Chapter 5 Content:

12. Be able to define and classify triangles as Scalene, Isosceles, Equilateral and Equiangular.
13. Solve for missing angles or sides of a triangle using facts about triangle interior angles (they add to 180 degrees), and straight angles (they also add to 180 degrees)
14. Use facts about Equilateral and Isosceles triangles to solve for missing angle measure or side lengths (base angles congruent, etc...)

Extra Content: (in hindsight this is mostly chapter 9 material that I covered early)

15. Solve for a missing 3rd side of a triangle using the Pythagorean Theorem
 - o $leg^2 + leg^2 = hypotenuse^2$
16. Use Sine, Cosine, and Tangent to find missing side lengths of a right triangle when one side and one side length are given. (SOH CAH TOA)
17. Use Inverse trig functions to determine missing angles of a right triangle.
18. Use a formula sheet for area/volume/surface area to solve problems that involve one missing variable.

Chapter 7 Content:

19. Determine the sum of the interior angles of any convex polygon given its number of sides.
 - o $Sum = (n - 2) * 180$
20. Use the sum of the interior angles of a polygon to determine the number of sides the polygon has.
21. Solve problems involving polygon interior angles
22. Solve for missing sides or angles of a parallelogram

Chapter 9 Content:

23. Use the Law of Sines to solve problems involving missing sides and angles involving oblique triangles.
 - o Law of Sines: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ (You can flip it, based on what you want to solve for. Put what you're solving for on top)
24. Use the Law of Cosines to solve problems involving missing sides and angles involving oblique triangles
 - o Law of Cosines: $a^2 = b^2 + c^2 - 2bc \cos A$, $b^2 = a^2 + c^2 - 2ac \cos B$, $c^2 = a^2 + b^2 - 2ab \cos C$ (use whichever based on the info you were given in the problem)

Chapter 10 Content:

25. Define and use the terms: Central Angle, Radius, Diameter, Inscribed Angle, Chord, Arc
26. Use knowledge of central angles to solve problems involving finding arc and central angle measures in a circle.
27. Use knowledge of inscribed angles to solve problems involving finding arc and inscribed angle measures in a circle.
28. Write the equation of a circle when given the center and radius, or a graph.
29. Find the center and radius of a circle when given the equation.

Problems to Practice.

The problems listed below are numbered. The numbers correspond to the concept number listed above. For Example. If you want to practice problems for concept #6 above, work out the problems on #6 below.

1. Pg 8: #'s 3, 4, 11-16
- 2 & 3. Pg 24-25: #'s 3-10, 15-18
4. Pg 25: #'s 23-30
5. Just define those words for practice. Be able to verbally explain what they mean using exact language.
6. Pg 42: #'s 21-30
7. Pg 50: #'s 3-10, 15-18
8. Pg 50: #'s 11-14
9. Pg 117-118: #'s 11-18, 25-28
- 10-11. Use the 3.5 Worksheet I printed for you to review these concepts.
12. Pg 212: #'s 3-10
13. Pg 212: #'s 11-18
14. Pg 232: #'s 7-16
15. Find the 3rd side of each of the triangles from problems 1-8 below using the Pythagorean theorem.
16. Solve for the missing side length using sine, cosine, or tangent in problems 49-54 below. (the examples with triangles)
17. Solve for the missing angle Theta in numbers 1-8 below using inverse trig functions.
18. Do the problems given on the next page. Use a formula sheet to assist you. (You won't have to memorize any formulas except the common ones. Area of triangle, circle, rectangle)
19. Pg 328: #'s 3-6
20. Pg 328: #'s 7-10
21. Pg 328: #'s 11-22
22. Pg 336: #'s 3-8, 17-18
23. Pg 463: #'s 9-18
24. Pg 463: #'s 19-24
25. Refer to your notes from 10.2 and 10.4
26. Pg 488: #'s 3-17
27. Pg 502: #'s 3, 4, 6, 8, 9-12
28. Do numbers 31-40 on the next page.
29. Do numbers 43-52 on the next page (NOT the triangles ones). The instructions are "State the center and radius of the circle whose equation is given."

Practice Exercises

In Exercises 1–8, use the Pythagorean Theorem to find the length of the missing side of each right triangle. Then find the value of each of the six trigonometric functions of θ .

1. $\angle C = 90^\circ$, $AC = 12$, $BC = 9$, $\angle A = \theta$
2. $\angle C = 90^\circ$, $AC = 8$, $BC = 6$, $\angle A = \theta$
3. $\angle C = 90^\circ$, $AC = 21$, $AB = 29$, $\angle A = \theta$
4. $\angle C = 90^\circ$, $AC = 15$, $AB = 17$, $\angle A = \theta$
5. $\angle C = 90^\circ$, $BC = 10$, $AB = 26$, $\angle A = \theta$
6. $\angle C = 90^\circ$, $AC = 40$, $AB = 41$, $\angle A = \theta$
7. $\angle C = 90^\circ$, $AC = 21$, $BC = 35$, $\angle A = \theta$
8. $\angle C = 90^\circ$, $AC = 25$, $BC = 24$, $\angle A = \theta$

49. $\angle C = 90^\circ$, $AC = 250$ cm, $\angle A = 37^\circ$, $BC = a$
50. $\angle C = 90^\circ$, $AC = 10$ cm, $\angle A = 61^\circ$, $BC = a$
51. $\angle C = 90^\circ$, $AC = b$, $AB = 220$ in., $\angle A = 34^\circ$
52. $\angle C = 90^\circ$, $AC = 13$ m, $\angle A = 34^\circ$, $BC = a$
53. $\angle C = 90^\circ$, $BC = 16$ m, $\angle A = 23^\circ$, $AB = c$
54. $\angle C = 90^\circ$, $BC = 23$ yd, $\angle A = 44^\circ$, $AC = b$

In Exercises 31–40, write the standard form of the equation of the circle with the given center and radius.

31. Center $(0, 0)$, $r = 7$ 32. Center $(0, 0)$, $r = 8$
33. Center $(3, 2)$, $r = 5$ 34. Center $(2, -1)$, $r = 4$
35. Center $(-1, 4)$, $r = 2$ 36. Center $(-3, 5)$, $r = 3$
37. Center $(-3, -1)$, $r = \sqrt{3}$ 38. Center $(-5, -3)$, $r = \sqrt{5}$
39. Center $(-4, 0)$, $r = 10$ 40. Center $(-2, 0)$, $r = 6$

43. $(x - 3)^2 + (y - 1)^2 = 36$
44. $(x - 2)^2 + (y - 3)^2 = 16$
45. $(x + 3)^2 + (y - 2)^2 = 4$
46. $(x + 1)^2 + (y - 4)^2 = 25$
47. $(x + 2)^2 + (y + 2)^2 = 4$
48. $(x + 4)^2 + (y + 5)^2 = 36$
49. $x^2 + (y - 1)^2 = 1$ 50. $x^2 + (y - 2)^2 = 4$
51. $(x + 1)^2 + y^2 = 25$ 52. $(x + 2)^2 + y^2 = 16$

Problems for #18.

1. Find the length of a rectangle with width of 9cm and an area of 54cm^2 .
2. Find the volume of a sphere with a radius of 7ft.
3. Find the height of a triangle with an area of 88in^2 and base of 16in.
4. Find the area of the circle with a radius of 9mm.
5. Find the surface area of a cube with a side length of 4m.
6. Find the radius of the short axis of an ellipse if the area is $66\pi\text{in}^2$ and the radius of the long axis is 11 in.
7. Find the height of a cylinder with a volume of $112\pi\text{cm}^3$ and a radius of 4 cm.
8. Find the base area of a pyramid with a volume of $\frac{160}{3}\text{cm}^3$ and height of 8 cm.
9. Find the base of the triangle with height of 7m and an area of 42m^2 .
10. Find the surface area of the cylinder with height of 10cm and radius of 3cm. Leave your answer in terms of pi.