Unit 4 – Tools of Geometry – Constructions

Mon-Tues, Sept 30-Oct 1, 2019

Objective: I can construct an equilateral triangle and a regular hexagon. I can copy a segment and an angle and apply to add segments or angles.

* Compasses/ test make-ups/ etc.
* In your notes: construct daily design; use to see regular hexagon, equilateral triangle, 60 and 120 degree angles.
* Read pp 150-1 about sketch, draw, construct. Compare measure to algebra with numbers, construct to algebraic proof… no numbers. Radius as fixed and reliable distance un-measured, as a deductive reason (per Euclid).
* Try Euclid’s proposition 1. Why does it work? Can you do it without making full circles?
* Can you construct a 60 degree angle? Have you already? What’s in your tool belt? What are we going to do with our basic tools?
* Notes and practice 3.1 – copying segments and angles
* View mathopenref construction of copying an angle. How to find.
* HW #12 – p 152-3:1-8.
* View tests in all but 3rd period.

Oct 2-3, Wed-Thurs, 2019

I can construct and interpret points on a perpendicular bisector of a segment and locate midpoints with this construction. I can construct a median in a triangle.

* Investigation: do p 59 #12, finding 5 equidistant points. Write up definitions with sketches for segment bisector, perpendicular bisector, median, midsegment (from section 3.2). Perpendicular bisector definition is on the board.
* Take a grade on HW #13 – 4 pts
* Share warm-up, homework discussion… Use P 59:12 as launch for perpendicular bisector construction.
* Go back to Euclid’s prop 1 construction of equilateral triangle. Connect the two arc intersection points. Is this the perpendicular bisector of AB? Why? Use the word equidistant to describe those two arc intersection points.
* Investigations 1 from section 3.2 – perpendicular bisector of a segment.
* Figure out C-5 and C-6 (every point on perpendicular bisector of a segment is equidistant from the endpoints of a segment… and its converse).
* Share constructions. How to do homework. How to construct a midpoint.
* Draw a triangle, construct two perpendicular bisectors, construction two medians.
* Try in class: draw a triangle, construct perpendicular bisector of two sides; construct a median from one of your discovered midpoints.
* HW #13 – pp 157-9: 1-5, 8-9, 18-23.
* View tests! Re-take and make-up issues.

October 4,7, Fri-Mon, 2019

Objective: I can construct a perpendicular segment from a point to a line and from a point on a line. I can construct altitudes in a triangle. I can bisect an angle.

* (New seats.) Write up C-5 and 6 from pp 155-6.
* Try: make a triangle and construct the midpoints of all three sides. Then connect midsegments. (p 150:9 in old book). Map a route to the fence and back in the sketch on the board.
* Take a grade on HW #14 – 4 pts
* Share good HW and discuss. How to construct a circumscribed circle on problem 8.
* Investigation 3.3.1 – perpendicular from point to line and shortest distance conjecture derived (along a “perpendicular”). Be sure to look at these on mathopenref.com if you missed class.
* Practice and notes: perpendicular from a point to a line, what is an altitude?, construct altitude in a triangle, construct perpendicular from a point on a line (which will give us a square, rectangle, or right triangle). Define and sketch: altitude.
* HW #14 – p 162:2,4-6, p 166:4-5
* Practice – angle bisector

Quiz Thurs-Fri, 20 pts 3.1-4

Tues-Wed, October 8-9, 2019

Objective: I can construct parallel lines. I can construct angle bisectors and understand why the construction works. I can synthesize basic constructions into more complicated combinations.

* Old book: p 158:1-7 (1-5 is matching of basic constructions, 6 is an isosceles right triangle, 7 is to copy a triangle from the 3 sides and construct a median and an angle bisector.
* Take a grade on HW #14 – 4 pts
* Go over warm-up and HW, sharing good work and reasoning.
* Angle Bisector Investigation and C-8: Every point on the angle bisector of an angle is equidistant from the sides of the angle. (patty paper construct angle bisector, compass construct shortest distance to sides of angles.
* Construct an altitude in an obtuse triangle. Construct parallel lines, any method.
* Geogebra demonstration – angle bisectors in one triangle, perpendicular bisectors in another. See how C-5 leads to circumscribed circle, C-8 leads to inscribed circle.
* Pass out Worksheet and Topic list. Explain some instructions on worksheet.
* HW #15 is the worksheet.
* Answers to worksheet on website.

Quiz Thurs-Fri, 3.1-4 – 22 pts;

Thurs-Fri, October 10-11, 2019

Objective: I can demonstrate mastery over synthesis of basic construction skills. I can construct and interpret points of concurrency.

* Speed Constructions warm-up
* Self-check HW and worksheet and warm-up
* Go over HW #15 add-on from textbook (see previous lesson)
* Investigation 3.7 – points of concurrency: circumcenter, incenter, orthocenter. Finish for HW and update geometric truth with definitions: concurrent lines, point of concurrency (sketch only), circumscribed circle, C-9-11 (see sketches and FITB on investigation).
* Homework #17 is listed at the bottom of the investigation in the daily blog post. (It says #16, but it is 17. P 167: 7-8, 11, 13, 16, 17, p 171:3, p 175-6: 1-3.
* Quiz 3.1-4 – 22 pts

Unit Assessment – Oct 18-19 next week. Topics given out next block.

Mon-Tues, Oct 14-15, 2019

Objective: I can discover and apply the centroid conjectures. I can construct circumscribed and inscribed circles, interpreting when points of concurrency are outside the triangle.

* In all classes – go over investigation 3.7 – adding information about obtuse and right triangles, adding circles, go over conjectures. Add C-12-13 from this page.
* Discuss and record C-12-13 – special distances; verbal justification from C-5 or 8
* Centroid Investigation 3.8. Write up C-14-16 from investigation.
* Take a grade on HW #17 – 4 pts (all but 3rd)
* Share “keys” for homework constructions. Go over HW. Share warm-up.
* Post HW #18 for A day: p 163:13-14, p 183:13-17, p 186:1-6,10 (may have been done in class), p 193:2-6. For B day: p 186:1-6 (may be done), p 193:2-6, p 196-8: 1,5,8-25,27-28. (the review assignment)
* view quizzes (returned on B day), make-up issues
* 0B quiz bonus

Unit test – Thurs-Fri, Oct 17-18 – 70 pts (B day will do one page on Thursday – constructing the four points of concurrency in 4 different triangles).

Wed-Thurs Oct 16-17, 2019

Objective: I can practice connecting definitions to constructions by a variety of methods, including technology.

* Go over HW carefully. Go over all conjectures since #8. Focus on what points can be outside or on the triangle (circumcenter, orthocenter)
* 1st period – pass out 3 triangle practice, 2nd period, return quizzes

OB:

* Vocabulary and explain why practice
* Algebra practice
* Test hints
* Self-check and question review assignment.
* Take 4-questions of test – construct the 4 pts of concurrency.

A day:

* Assign Unit Review: p 193:2-6 (if not done yet), pp 196-8: 1,5,8-25,27-28

Unit Test – Fri-Mon, Oct 18, 21, 2019 75 pts

Friday-Monday, Oct 18-21, 2019

Objective: I can demonstrate mastery over constructions and points of concurrency.

* Warm-up: vocabulary related to points of concurrency and naming.
* Practice cheer.
* Take a grade over review – 4 pts, self-check from answers.
* Warm-up: algebra and self check
* Unit Test – 2nd and 3rd period did not get to do the “explain why” questions due to technical issues.
* 0B finished their tests and started working on reflections from the new unit. They had already done the warm-up on Thursday.