

Math 45021 Homework 2

Due February 13th

1. pg. 27: 2.2, 2.3, 2.4, 2.5, 2.9
2. Let ABC be an isosceles triangle with $AB = BC$. Let BD be an angle bisector. Show that BD is also a median (splits the side into equal parts) and an altitude (is the perpendicular line from B to the opposite side).
3. Let $ABCD$ be a square with an equilateral triangle ABG sharing one side with G outside $ABCD$. Find the measure of the angle $\angle DGC$
4. In Geogebra: Create a parallelogram $ABCD$ and construct one diagonal. From the remaining vertices construct segments perpendicular to the diagonal. What is the relationship between the length of these segments? Prove it. No figures need to be turned in.
5. In Geogebra: Create a quadrilateral $ABCD$. Find the midpoints for each edge and label them $E, F, G,$ and H . Connect the midpoints to form a new quadrilateral $EFGH$. What can you say about $EFGH$ when:
(You may “eyeball” these figures. That is, you don’t have to construct them exactly.)
 - (a) $ABCD$ is a general convex quadrilateral?
 - (b) $ABCD$ is a general non-convex quadrilateral?
 - (c) $ABCD$ is a rhombus?
 - (d) $ABCD$ is a parallelogram?
 - (e) $ABCD$ is a rectangle?
 - (f) $ABCD$ is a square?

No figures need to be turned in, just tell me what you observed.