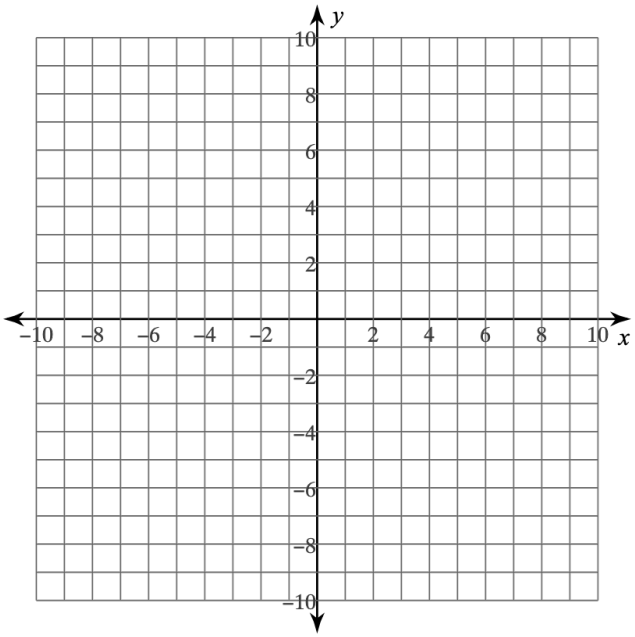
Math 10D – Unit 2: Analytic Geometry Name: Answers.

Homework 2.2 – Big Questions using Midpoint and Distance Date: Today.

1. Equation of the Median:

Plot the points $A(-3,-1), B(3,5), C(7,-3)$. Draw the triangle. Find the equation of the medians from vertex A, vertex B, and vertex C. (note: this is three separate equations).



From vertex A:

$$y = \frac{1}{4}x - 0.25$$

From vertex B:

$$y = 7x - 16$$

From vertex C:

$$y = \frac{-5}{7}x + 2$$

2. Determine the Equation of the Perpendicular Bisector:

a) $A(1,8)$ and $B(5,2)$

$y = \frac{2}{3}x + 3$

b) $C(4,6)$ and $B(12,-4)$

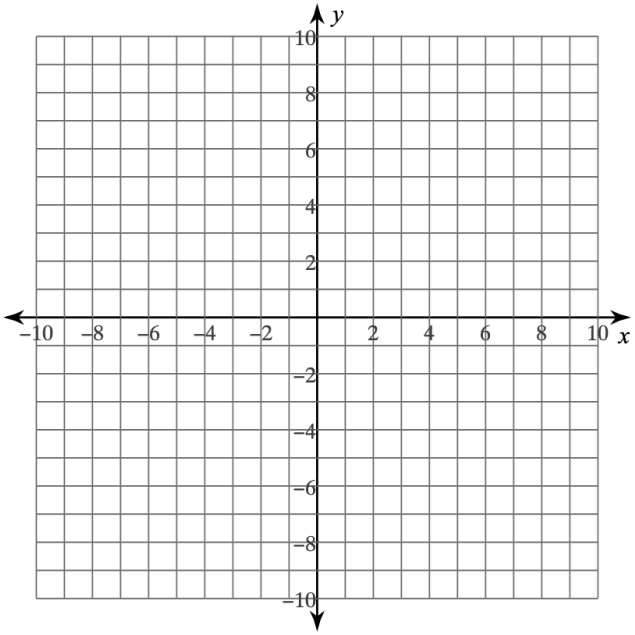
$y = \frac{4}{5}x - 5.4$

3. Midsegments

Plot the triangle $P(7,7), Q(-3,-5), R(5,-3)$. Draw the midsegment from line PQ to line PR. Calculate the slope of that midsegment, then the slope of line QR. What do you notice?

Slope of midsegment: $m = \frac{1}{4}$

Slope of QR: $m = \frac{1}{4}$



4. Calculate the length of the shortest distance from the point to the line:

a) $y = \frac{-2}{3}x + 4$ and $A(7,8)$

Equation of perpendicular line:

$y = \frac{3}{2}x - 2.5$

POI is $(3,2)$

Distance is 7.21 units

b) The point $D(-2,10)$ to the line formed by $A(-4,-6)$ and $B(12,-2)$. (Note: Need y=mx+b).

Line of AB: $y = \frac{1}{4}x - 5$

Line $\perp$ to AB: $y = -4x + 2$

POI: $(1.6, -4.6)$

Distance: 15ish units.