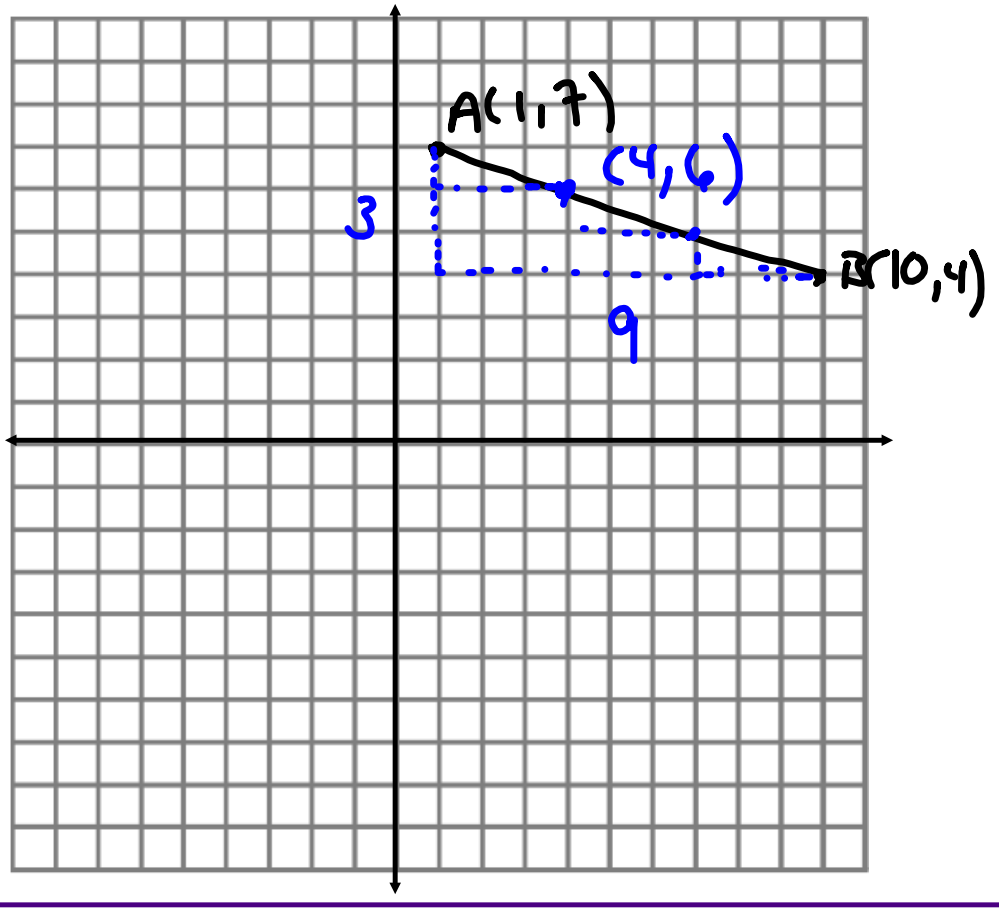
Monday, March 2, 2020

Bellwork:

Use the grid provided or a sticky grid or graph paper to draw out #19 on p. 80. Try to find the coordinates of the point that they are asking for, and explain how you did it.



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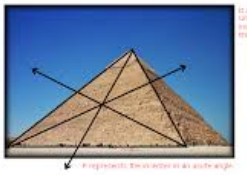
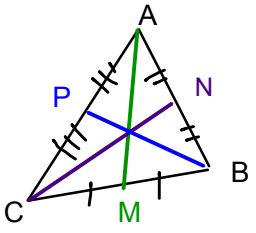


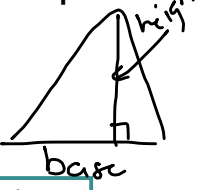
2.1 Continued - Applications of Midpoint

1) Finding the Equation of a Median

median - a line that connects a vertex of a triangle to the midpoint of the opposite side.



AM, BP, and CN are medians of triangle ABC.



Remember that you need slope and one point to find the equation of a line.

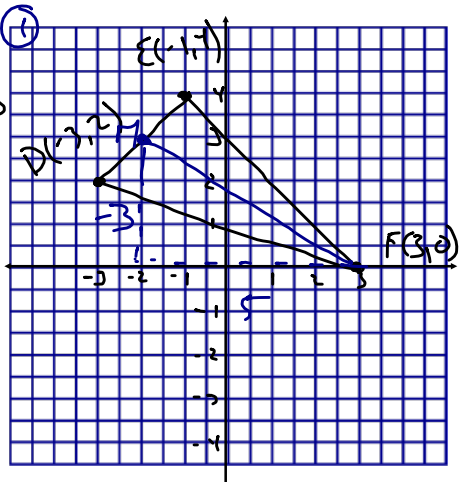
How can we find the equation of a median?

★① Draw a diagram.
② Find the midpoint of the side being cut in half.
③ Find the slope of the median using its endpoints
④ Use the slope and one point to find the equation

Example: DEF has vertices D(-3, 2), E(-1, 4), and F(3, 0). Find the equation of the median that bisects DE.

We need the equation of FM.
We know a point (F). We need to find slope.

(bisects = cut into two equal parts)

① 

② Find midpoint of DE

$M_{DE} = \left(\frac{-3+(-1)}{2}, \frac{2+4}{2}\right)$

$= (-2, 3)$

③ Find slope of FM

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{3-0}{-2-3}$

$= -\frac{3}{5}$

★ Use F(3,0) and M_{DE}

④ Get an equation:

$y = mx + b$

$0 = -\frac{3}{5}(3) + b$

$0 = -\frac{9}{5} + b$

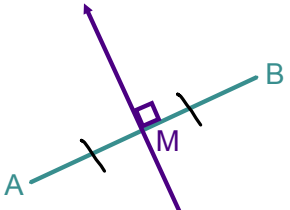
$\frac{9}{5} = b$

$y = -\frac{3}{5}x + \frac{9}{5}$

2) Finding the Equation of a Perpendicular Bisector

perpendicular bisector - **a line that passes through the midpoint of a line segment at a 90° angle.**

↳ meets at 90°



Lines that are ⊥ have slopes that are opposite reciprocals

$m = 2, m_{\perp} = -\frac{1}{2}$

How can we find the equation of a perpendicular bisector?

① Draw a diagram.

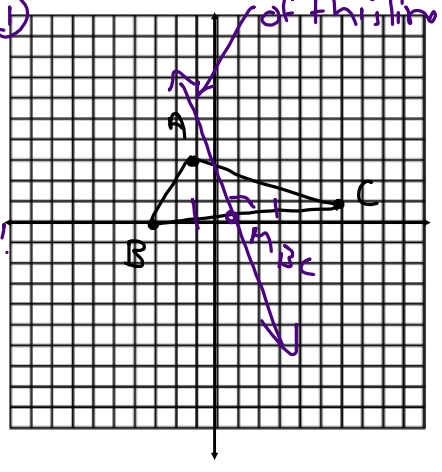
② Find the slope of the line segment being cut in half and use it to get the slope of the ⊥ bisector.

③ Find the midpoint of the line segment.

④ Find the equation.

Example: ΔABC has vertices A(-1,3), B(-3, 0), and C(6, 1). Find the equation of the perpendicular bisector of side BC.

① We need the equation of this line



② Find the slope of BC

$m_{BC} = \frac{1-0}{6+3} = \frac{1}{9}$

$m_{\perp} = -9$ now we have slope!

③ Find M_{BC} and a point!

$M_{BC} = \left(\frac{-3+6}{2}, \frac{0+1}{2}\right)$

$= (1.5, 0.5)$ or $\left(\frac{3}{2}, \frac{1}{2}\right)$

④ Find the equation.

$y = mx + b$

$\frac{1}{2} = -9\left(\frac{3}{2}\right) + b$

$\frac{1}{2} = -\frac{27}{2} + b$

$\frac{1}{2} + \frac{27}{2} = b$

$\frac{28}{2} = b$

$14 = b$

$y = -9x + 14$