MPM 2DI 2.1 The Midpoint of a Line Segment (Day 3) Date: Spring 2013

Ex. Given ΔABC with A (6 , 15), B(-2 , 3) and C(26 , 3):

a) Find M, the midpoint of AB.
b) Find N, the midpoint of AC.
c) Find the equation of the median, CM, from C.
d) Find the equation of the median, BN, from B.
e) Find the P.O.I. of the two medians.

a) $M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$= M\left(\frac{-2+6}{2}, \frac{3+15}{2}\right)$

$= M\left(\frac{4}{2}, \frac{18}{2}\right)$

$= M(2, 9)$

b) $N\left(\frac{26+6}{2}, \frac{3+15}{2}\right)$

$= N\left(\frac{32}{2}, \frac{18}{2}\right)$

$= N(16, 9)$

c) $m_{CM} = \frac{y_2-y_1}{x_2-x_1}$

$= \frac{3-9}{26-2}$

$= \frac{-6}{24}$

$= \frac{-1}{4}$

$y = \frac{-1}{4}x + b$

$(9) = \frac{-1}{4}(2) + b$

$9 = \frac{-1}{2} + b$

$9 + \frac{1}{2} = b$

$\frac{18}{2} + \frac{1}{2} = b$

$\frac{19}{2} = b$

$\therefore y = \frac{-1}{4}x + \frac{19}{2}$

↳ $4y = -x + 38$

$x + 4y = 38$ ①

$-x + 3y = 11$

$7y = 49$

$y = 7$

d) $m_{BN} = \frac{y_2-y_1}{x_2-x_1}$

$= \frac{9-3}{16-(-2)}$

$= \frac{6}{18}$

$= \frac{1}{3}$

$\therefore y = \frac{1}{3}x + b$

$(9) = \frac{1}{3}(16) + b$

$9 = \frac{16}{3} + b$

$\frac{27}{3} - \frac{16}{3} = b$

$\frac{11}{3} = b$

$\therefore y = \frac{1}{3}x + \frac{11}{3}$

↳ $3y = x + 11$

$x - 3y = -11$ ②

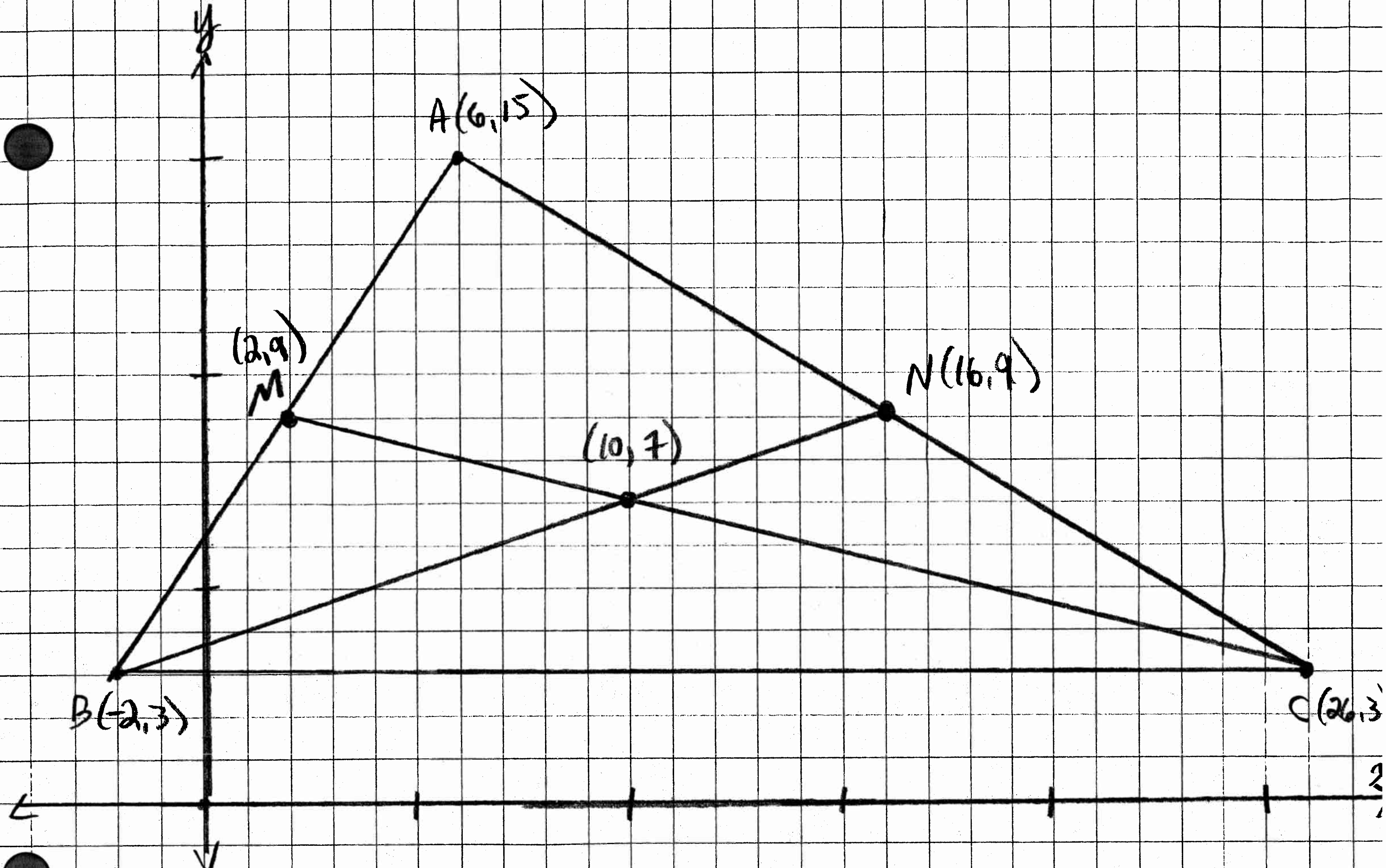
Sub in ①

$x + 4(7) = 38$

$x = 38 - 28$

$= 10$

$\therefore$ (10, 7) is the P.O.I. of the two medians.


y
A(6,15)
(2,9)
M
N(16,9)
(10,7)
B(-2,3)
C(26,3)