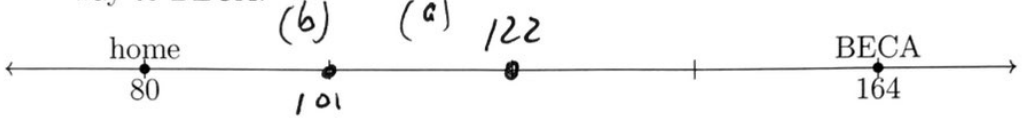
BECA / Dr. Huson / Geometry
Unit 1: Segments, length, and area
18 October 2022

Name: Solutions

3.2 Extension: Ratio partition of a line segment

The distance formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

1. Do Now: Dr. Huson's commute is from 80th Street to 164th Street.
   (a) On what block is he half way? Mark it and label it with the street number.
   (b) On the way to work, mark and label the block when he is three-quarters of the way to BECA.

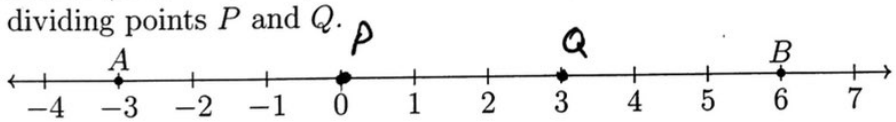


$\frac{164-80}{2} = 42$ $\qquad$ $\frac{3}{4}(164-80) = 63$

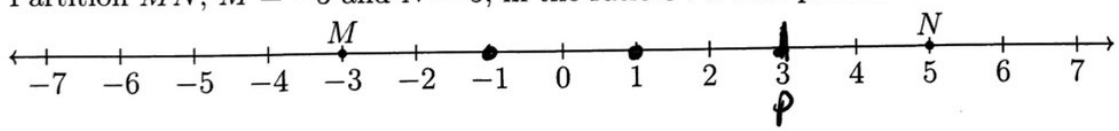
$80 + 42 = 122$ $\qquad$ $164 - 63 = 101$

2. Find each pair of numbers with the given sum.
   (a) Example: Two numbers with a ratio of 3 : 1 that sum to 20 are 15 : 5.
   (b) 2 : 1, sum 9 $\qquad$ 6:3
   (c) 1 : 1, sum 100 $\qquad$ 50:50
   (d) 2 : 3, sum 20 $\qquad$ 8:12

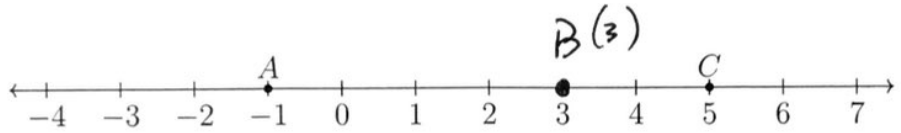
3. Divide (partition) $\overline{AB}$, $A = -3$ and $B = 6$, into three equal parts. Mark and label the dividing points P and Q.



4. Partition $\overline{MN}$, $M = -3$ and $N = 5$, in the ratio 3 : 1 with point P.



5. The point B is two thirds of the way from $A = -1$ to $C = 5$. Find the coordinate of B. Mark and label B on the graph of $\overleftrightarrow{AC}$.

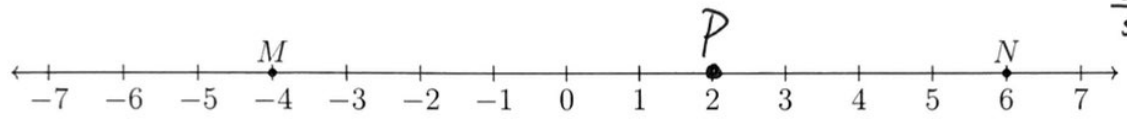


6. Point P partitions $\overline{MN}$, $M = -4$ and $N = 6$, in the ratio $3 : 2$. Find the value of point P. Mark and label P on the graph.

$d = 6-(-4) = 10$

$\frac{3}{5} \cdot 10 = 6$

$-4+6=2$

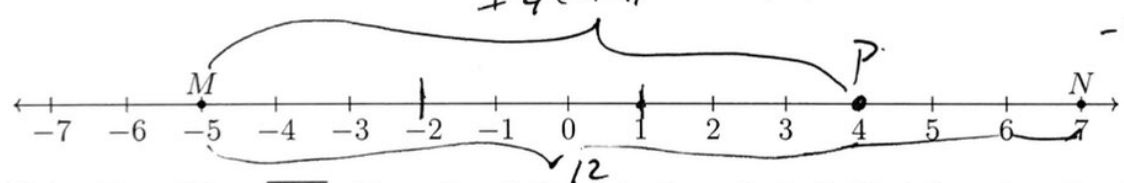


7. Point P partitions $\overline{MN}$, $M = -5$ and $N = 7$, in the ratio $3 : 1$. Find the value of point P. Mark and label P on the graph.

$\frac{3}{4} : \frac{1}{4}$ $7-(-5)=12$ $12(\frac{3}{4}) = 9$

$+\frac{3}{4}(12)=9$

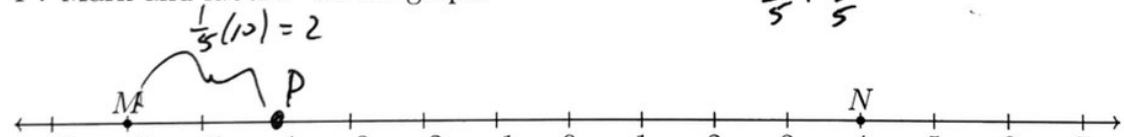
$-5+9=4$



8. Point P partitions $\overline{MN}$, $M = -6$ and $N = 4$, in the ratio $1 : 4$. Find the value of point P. Mark and label P on the graph.

$\frac{1}{5} : \frac{4}{5}$

$\frac{1}{5}(10) = 2$



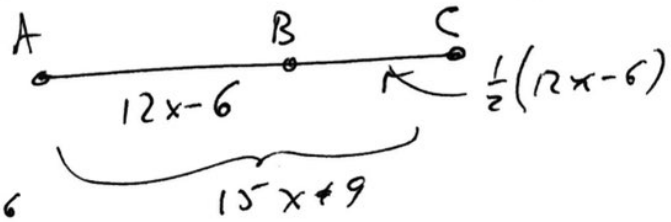
$4-(-6)=10$

9. In the line segment $\overline{ABC}$, $\overline{AB}$ is twice as long as $\overline{BC}$. $AB = 12x - 6$ and $AC = 15x + 9$. Find BC.

$\frac{3}{2}(12x-6) = 15x+9$

$6x-3 = 5x+3$

$x = 6$



$\frac{1}{2}(12x-6)$

$AB = 12(6)-6$

$= 66$

$BC = 33$

$AC = 15(6)+9 = 99$

$66+33=99$ ✓