Name _____ Class _____ Date _____

3-5

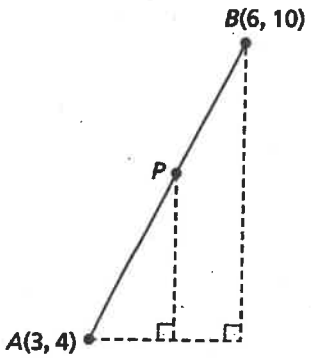
Slopes of Lines

Extension: Using Slope to Partition Segments

G-GPE.2.6

1 EXAMPLE Partitioning a Segment

Find the coordinates of the point P that lies along the directed line segment from $A(3, 4)$ to $B(6, 10)$ and partitions the segment in the ratio 3 to 2.



A Convert the ratio to a percent.

Point P is $\frac{3}{3+2} = \frac{3}{5}$ of the distance from A to B.

This is _____% of the distance from A to B.

B Find the rise and run for $\overline{AB}$.

Rise $= 10 - 4 = 6$ Run = _____

C The slope of $\overline{AP}$ must be the same as the slope of $\overline{AB}$.

So, to find the coordinates of P, add _____% of the run to the x-coordinate of A and add _____% of the rise to the y-coordinate of A.

x-coordinate of $P = 3 +$ $\cdot 3 =$ _____

y-coordinate of $P = 4 +$ $\cdot$ $=$ _____

So, the coordinates of P are _____.

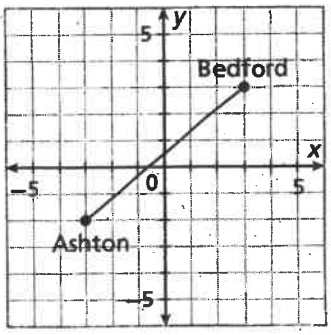
1. Find the coordinates of the point P that lies along the directed segment from $C(-3, -2)$ to $D(6, 1)$ and partitions the segment in the ratio 2 to 1.

2. Find the coordinates of the point P that lies along the directed segment from $R(-3, -4)$ to $S(5, 0)$ and partitions the segment in the ratio 2 to 3.

3. Find the coordinates of the point P that lies along the directed segment from $J(-2, 5)$ to $K(2, -3)$ and partitions the segment in the ratio 4 to 1.

4. Find the coordinates of the point P that lies along the directed segment from $M(5, -2)$ to $N(-5, 3)$ and partitions the segment in the ratio 1 to 3.

5. The map shows a straight highway between two towns. Highway planners want to build two new rest stops between the towns so that the two rest stops divide the highway into three equal parts. Find the coordinates of the points at which the rest stops should be built.



6. $\overleftrightarrow{RS}$ passes through $R(-3, 1)$ and $S(4, 3)$. Find a point P on $\overleftrightarrow{RS}$ such that the ratio of RP to SP is 5 to 4. Is there more than one possibility? Explain.

7. Find the coordinates of the point P that lies along the directed line segment from $A(3, 1)$ to $B(6, 7)$ and partitions the segment in the ratio 2 to 1.

8. Find the coordinates of the point P that lies along the directed line segment from $C(-3, -2)$ to $D(5, 2)$ and partitions the segment in the ratio 1 to 4.

9. Find the coordinates of the point P that lies along the directed line segment from $E(-5, 5)$ to $F(-2, -2)$ and partitions the segment in the ratio 1 to 1.5.

10. Find the coordinates of the point P that lies along the directed line segment from $G(1, 1)$ to $H(8, 1)$ and partitions the segment in the ratio 1 to 3.