

$$\left[x_1 + \frac{a}{a+b}(x_2 - x_1), y_1 + \frac{a}{a+b}(y_2 - y_1) \right]$$

Geometry

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Homework – Partitioning Line Segments

1. Find the coordinates of P so that P partitions the directed segment AB in the ratio 5:1 if A(2, 4) and B(8, 10).

a b x_1 y_1 x_2 y_2

$$2 + \frac{5}{6}(8-2) \quad 4 + \frac{5}{6}(10-4)$$

$$P: (7, 9)$$

2. Find the coordinates of P so that P partitions the directed segment AB in the ratio 1 to 3 if A(-5, 4) and B(7, -4).

a b x_1 y_1 x_2 y_2

$$-5 + \frac{1}{4}(7 - (-5)) \quad 4 + \frac{1}{4}(-4 - 4)$$

$$P_1: (-2, 2)$$

3. Find the coordinates of P so that P partitions the directed segment AB in the ratio 3:4 if A(-9, -9) and B(5, -2).

a b x_1 y_1 x_2 y_2

$$-9 + \frac{3}{7}(5 - (-9)) \quad -9 + \frac{3}{7}(-2 - (-9))$$

$$P_1: (-3, -6)$$

4. Find the coordinates of P so that P partitions the directed segment AB in the ratio 5 to 2 if A(-8, -2) and B(6, 19).

a b x_1 y_1 x_2 y_2

$$-8 + \frac{5}{7}(6 - (-8)) \quad -2 + \frac{5}{7}(19 - (-2))$$

$$P_1: (2, 13)$$

5. Given the points A(-2, 5) and B(2, 3), find the coordinates of the point P on directed line segment AB that partitions AB into a ratio of 3 to 5.

x_1 y_1 x_2 y_2

$$-2 + \frac{3}{8}(2 - (-2)) \quad 5 + \frac{3}{8}(3 - 5)$$

a b

$$P: (-.5, 4.25)$$

Use the graph of the UGA campus to answer the following questions. GO DAWGS!

6. On a beautiful Saturday afternoon in Athens, you leave your dorm to go to a football game at the stadium. You stop at the bookstore four-fifths of the way to get some red UGA pom poms. Where is the bookstore located?

$$\begin{array}{l} \text{Dorm } (17, 5) \quad \text{Stadium } (8, 20) \\ x_1, y_1 \quad \quad \quad x_2, y_2 \\ 17 + \frac{4}{5}(8-17) \quad 5 + \frac{4}{5}(20-5) \\ \boxed{\text{Bookstore } (9.8, 17)} \end{array}$$

7. After winning a big rivalry game at the football stadium, you plan to meet some friends at the Game Center, which is 1/6 of the way from the stadium to the dining hall. Where is the Game Center located?

$$\begin{array}{l} \text{Stadium } (8, 20) \quad \text{Dining Hall } (8, 2) \\ x_1, y_1 \quad \quad \quad x_2, y_2 \\ 8 + \frac{1}{6}(8-8) \quad 20 + \frac{1}{6}(2-20) \\ \boxed{\text{Game Center } (8, 17)} \end{array}$$

8. On the way to your big math midterm exam, you leave the library and stop at the coffee shop which is one-fourth of the way to your math class. Where is the coffee shop located?

$$\begin{array}{l} \text{Library } (9, 11) \quad \text{Math Class } (1, 8) \\ x_1, y_1 \quad \quad \quad x_2, y_2 \\ 9 + \frac{1}{4}(1-9) \quad 11 + \frac{1}{4}(8-11) \\ \boxed{\text{Coffee Shop } (7, 10.25)} \end{array}$$

9. You always make sure to grab some breakfast before your 8AM English class. On your walk from the dining hall to your English class, you stop halfway to enjoy the beautiful sunrise over the park. What is the location of your favorite sunrise spot?

$$\begin{array}{l} \text{Dining Hall } (8, 2) \quad \text{English } (17, 15) \\ 8 + \frac{1}{2}(17-8) \quad 2 + \frac{1}{2}(15-2) \\ \boxed{\text{Sunrise Spot } (12.5, 8.5)} \end{array}$$

Midpoint or Partition Formula

10. You left math class and walked to the intramural field to play in a baseball game. The intramural fields are located five-eighths of the way from your math class to your English class. Where are these fields located?

$$\begin{array}{l} \text{Math Class } (1, 8) \quad \text{English Class } (17, 15) \\ x_1, y_1 \quad \quad \quad x_2, y_2 \\ 1 + \frac{5}{8}(17-1) \quad 8 + \frac{5}{8}(15-8) \\ \boxed{\text{Field } (11, 12.375)} \end{array}$$

