Midpoint Problems

1. Determine the coordinates of the midpoint M of the line segment with endpoints A (–3, 5) and B (3, 5).

2. ABCD is a parallelogram with points A (0, 5), B (2, –1), C (–6, 5), D (–4, –1). Determine the midpoint of each diagonal AD and BC.

3. A median of a triangle is a line that joins the midpoint of a side to the opposite vertex. Triangle PQR has points P (–2, 4), Q (–4, –4), R (6, 0).

    a. Find the midpoint of QR.
    b. Find the length of the median from P to the opposite side.

4. In a Western movie two men decide to have a duel. They must walk 20 paces, turn, and fire. If one man ends up at coordinates $\left(\frac{2}{3}, \frac{8}{5}\right)$ and the other at coordinates $\left(\frac{1}{2}, \frac{1}{3}\right)$, what were the coordinates from which they started walking. (Assume they were back to back and walked on a straight line away from each other).

5. Two airplanes leave Winnipeg International Airport. One flies due east toward Toronto, while the other flies due west toward Vancouver. After one hour, a radio station finds that the Toronto-bound airplane has coordinates (300, 850) and the Vancouver-bound airplane has coordinates (–50, 700). Assuming they are flying at the same speed, and that Winnipeg International Airport is the same distance from each plane, what are the coordinates for Winnipeg International Airport?

6. Two boats are travelling from Tunis to Crete on the Mediterranean Sea. A buoy with coordinates (10, 211) is directly between them. If one ship has coordinates (8, 76), what are the coordinates of the other ship?

7. A,B, C, and D are the vertices of a rectangle. If A has coordinates (0, 3), B has coordinates (–2, 0), and C has coordinates (4, –4), find the coordinates of vertex D. ***Hint***: the diagonals of a rectangle bisect each other.

Answer Key

1. (0, 5)
2. AD (–2, 2), BC (–2, 2)
3. a) (1, –2) b) $3\sqrt{5}$
4. $\left(\frac{7}{12}, \frac{29}{30}\right)$
5. (125, 775)
6. (12, 346)
7. (6, –1)