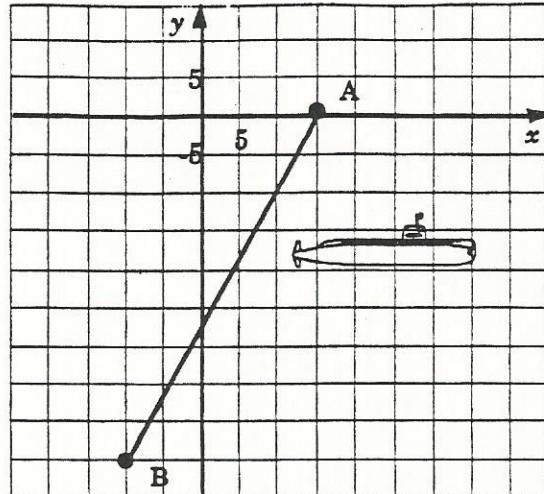
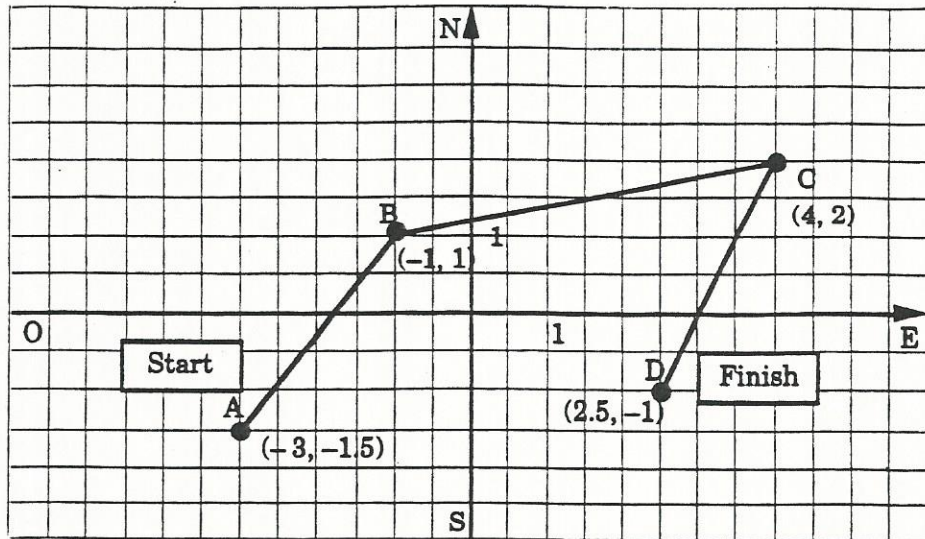


COORDINATES OF A POINT THAT DIVIDES A LINE SEGMENT IN A PARTICULAR RATIO

1. This Cartesian graph shows the path of a submarine. Mechanical problems forced the captain to stop the engines $\frac{5}{7}$ of the way through the journey. Determine the coordinates of the point corresponding to this stop if the starting point is $A(15, 0)$ and the destination is $B(-10, -45)$. Show all the steps in the solution.



2. The Cartesian graph below shows the route the Fords took during a rally.



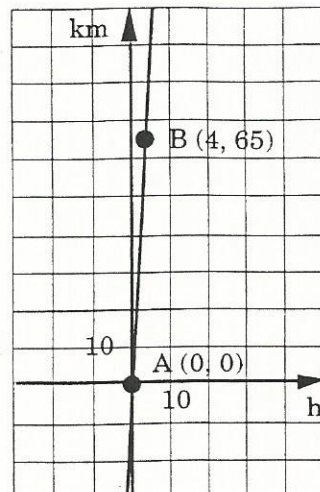
- a) Determine the coordinates of the first checkpoint if it is located $\frac{1}{5}$ of the way along \overline{AB} .

b) What are the coordinates of the second checkpoint if it is the midpoint of \overline{BC} ?

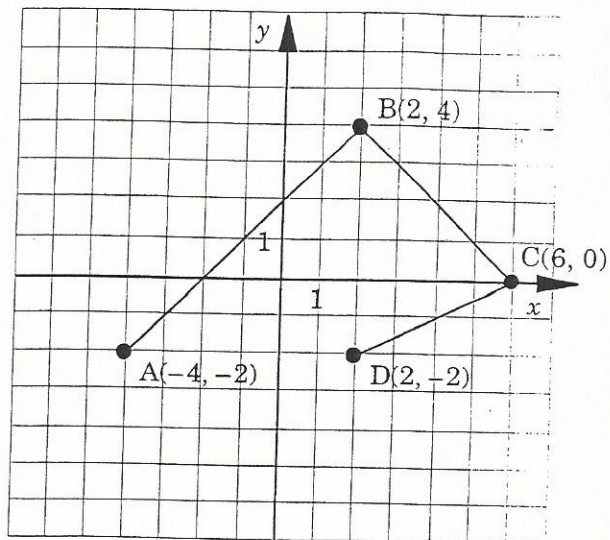
c) The Fords filled up at a third checkpoint located $\frac{1}{6}$ of the way along \overline{CD} . Find the coordinates of this point.

d) Determine the coordinates of their fourth checkpoint if it divides \overline{CD} in the ratio of $\frac{8}{9}$.

3. A cyclist made the 65-km trip between point A and point B in 4 hrs. Determine the coordinates (h, km) of the point corresponding to his first stop, which occurred $\frac{1}{3}$ of the way into his trip, as well as the coordinates of the point representing his second stop if this point divides his journey in the ratio of $\frac{3}{1}$.



4. Elaine is in pharmaceutical sales and her customers are located along the route shown in the Cartesian plane on the right. Today, she is visiting a doctor whose clinic lies $\frac{4}{5}$ of the way along \overline{AB} , as well as two pharmacists. The first drugstore is located halfway along \overline{BC} and the second is at a point that divides \overline{CD} in a ratio of $\frac{4}{7}$. Find the coordinates of the points corresponding to each customer.



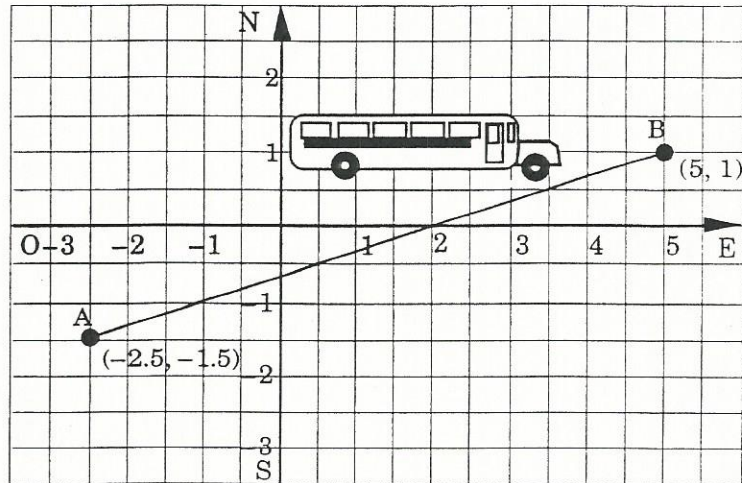
5. Every morning, a school bus takes the route shown in the Cartesian plane below. Determine the coordinates of the four points at which the driver must pick up or drop off the children if these points divide \overline{AB} in the ratios given below.

a) $\frac{1}{7}$

b) $\frac{3}{5}$

c) $\frac{5}{3}$

d) $\frac{3}{1}$



6. Suppose the endpoints of line segment AB are $A\left(\frac{5}{2}, -5\right)$ and $B\left(\frac{-7}{2}, 2\right)$. If we start from point A, what are the coordinates of the three points that divide line segment AB into four equal parts?

Some Practice Problems... Answers...

1. $(-2.86, -32.14)$

2. a) $(-2.6, -1)$

b) $(1.5, 1.5)$

c) $(3.75, 1.5)$

d) $(3.29, 0.59)$

3. a) $(1.33, 21.67)$

b) $(3, 48.75)$

4. 1st customer: $(0.8, 2.8)$

2nd customer: $(4, 2)$

3rd customer: $(4.55, -0.73)$

5. a) $(-1.56, -1.19)$

b) $(0.31, -0.56)$

c) $(2.19, 0.06)$

d) $(3.13, 0.38)$

6. a) $a=1, b=3$
 $P(1, -3.25)$

b) $a=1, b=1$
 $P(-0.5, -1.5)$

c) $a=3, b=1$
 $P(-2, 0.25)$