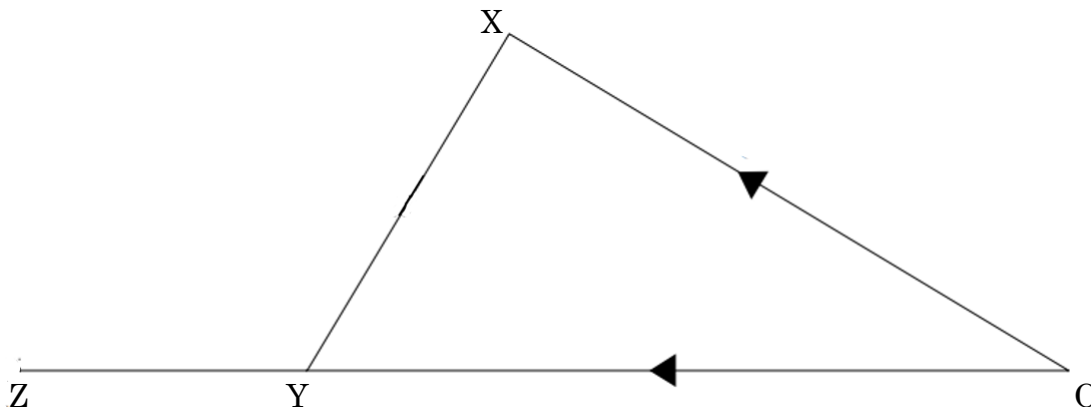




Vectors Exam Practice

Q1. In the diagram below, $\vec{OX} = \mathbf{a}$, $\vec{OY} = \mathbf{b}$, and OYZ is a straight line.



a) Find \vec{XY} in terms of \mathbf{a} and \mathbf{b}

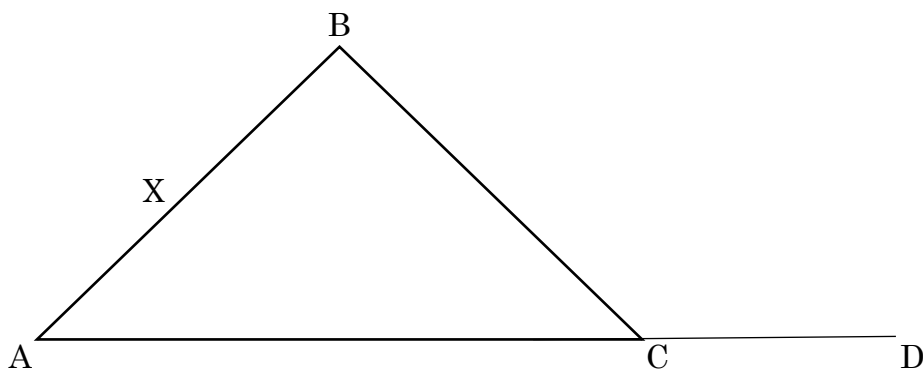
Answer: _____
(2 marks)

b) Given that Y divides the line OZ so that $YZ : OY$ is $3 : 5$, find \vec{ZX} in terms of \mathbf{a} and \mathbf{b}

Answer: _____
(3 marks)



Q2. In the triangle ABC below, X is the midpoint of AC, and Y is on the line BC so that $BY : YC$ is $5 : 4$, and $AC : AD$ is $3 : 5$.



Prove that XYD is not a straight line.

Answer: _____
(5 marks)



Q3. A ship sets off from a harbour H, which is located at $(-4, 8)$ and is heading towards a port P which is located at $(32.25, -21)$.

The ship is travelling at $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$ km/hour.

a) Find what time the boat reaches the port if it sets off at 3.15pm.

Answer: _____
(3 marks)

b) Calculate the bearing on which the ship is travelling. Give your answer to the nearest degree.

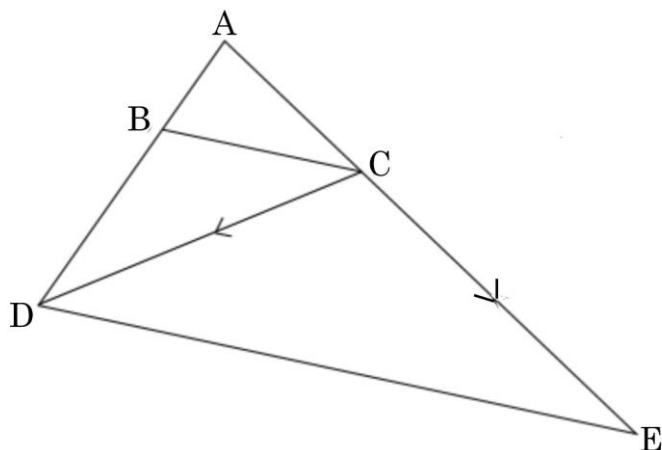
Answer: _____
(3 marks)



Q4. In the diagram below, ADE is a triangle.

You are given that $\overrightarrow{CD} = \mathbf{b} - \mathbf{a}$, and $\overrightarrow{CE} = -\mathbf{a} - 3\mathbf{b}$, and that $\overrightarrow{CA} = \frac{1}{3}\overrightarrow{EC}$ and that $\overrightarrow{AB} = -\frac{1}{3}\mathbf{a}$

Prove that BC is parallel to DE.



Answer: _____

(4 marks)