Vectors in Two Dimensions

Problems Worksheet

Step Up In Physics
Unit 3 and 4
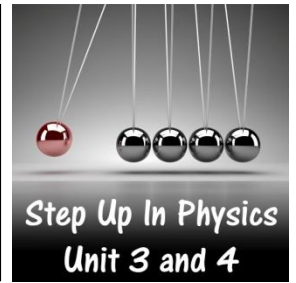
1. Combine the following vectors using <u>graphical</u> methods (head to tail). Show the resultant as well. Label each vector.
   a) B+C   b) C+E   c) A+B   d) B+C+A   e) A+B+C   f) D+A   g) A+B+C+D+E
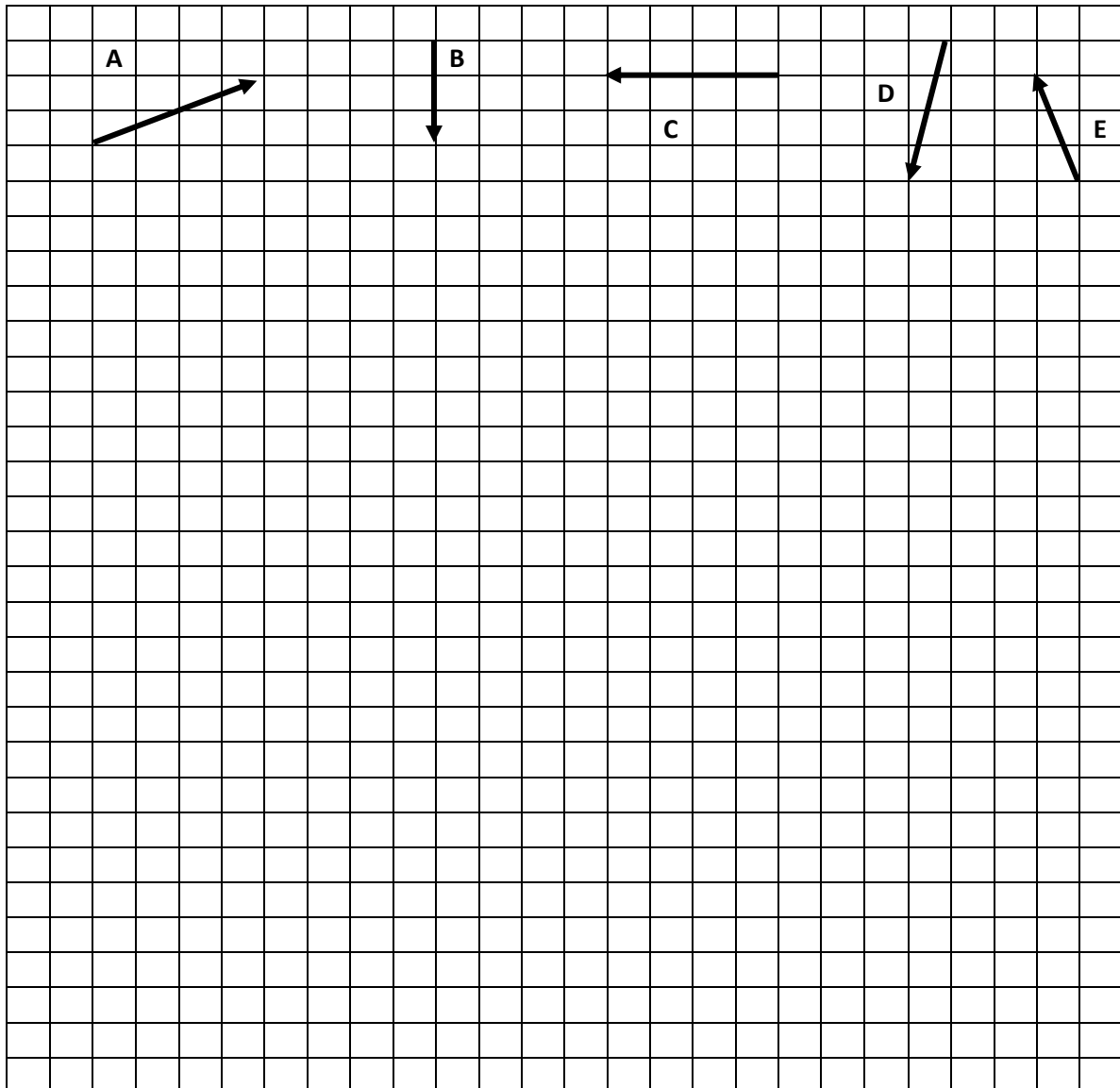
2. John travels from his cabin in the mountains for 13 km at a bearing of 30° T then heads 7km at a bearing of 225° T. What distance and direction does he end up from the cabin?

3. To get to school in the morning, Peter walks 2.00 km North, then 2.00 km East and finally 1.00 km North-West. What is the distance and bearing of the School from Peter's house?

4. Mr. Grasl kayaks across the swan river. He provides a force of 90.0 N to cross directly across the river from one bank to another. At the same time, the flow of the river provides a force of 30.0 N to the kayak. Draw a vector diagram to show this situation, labelling all vectors. What is the resultant force felt by the kayak?

5. Two soccer players come in to kick the ball at the same time. One approaches from the south and kicks with a force of 180 N. The second player comes from the north-east and kicks with a force of 120 N. Draw a vector diagram to show the situation, labelling all vectors. What is the resultant force felt by the soccer ball?

6. A parachutist feel a force due to gravity based on his mass and gravity (F_g=mg). The parachute supplies a force in the opposite direction by using air resistance. The parachutist and parachute have a combined mass of 110 kg and the air resistance applied to the parachute is 900 N. A stiff breeze works in a parallel direction to the horizon which pushes on the parachutist with a force of 40.0 N. Draw a vector diagram to show this situation, labelling all vectors. What is the resultant force felt by the parachutist?