

1.3 Vectors and scalars. © IBO 2007

1.3.1 Distinguish between vector and scalar quantities, and give examples of each. © IBO 2007

1.3.1.1 Distinguish between a scalar and a vector quantity.

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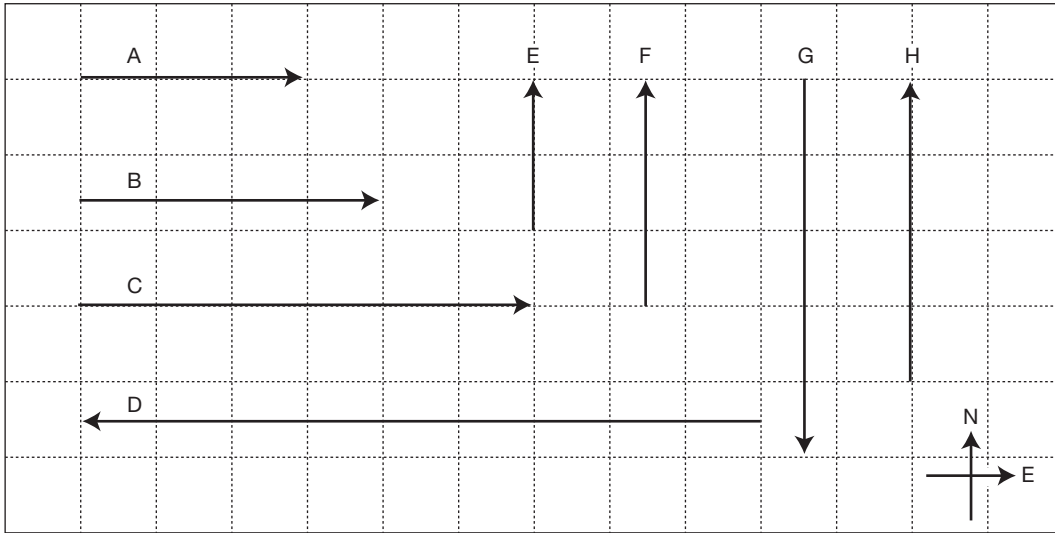
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1.3.1.2 Complete the table to list scalar and vector quantities and the main units we use to measure them.

Scalar quantities			Vector quantities		
Quantity	Symbol	Unit	Quantity	Symbol	Unit

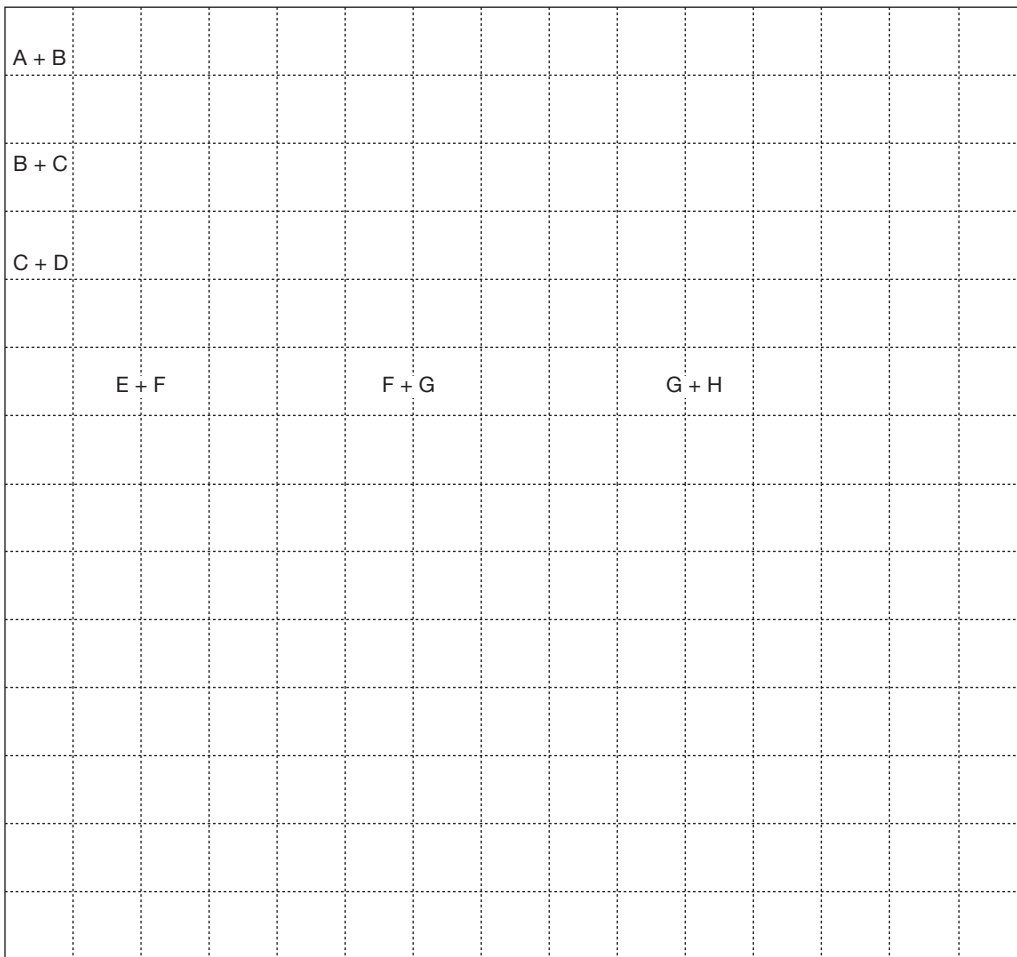
1.3.2 Determine the sum or difference of two vectors by a graphical method. © IBO 2007

1.3.2.1 The diagram represents several displacement vectors.

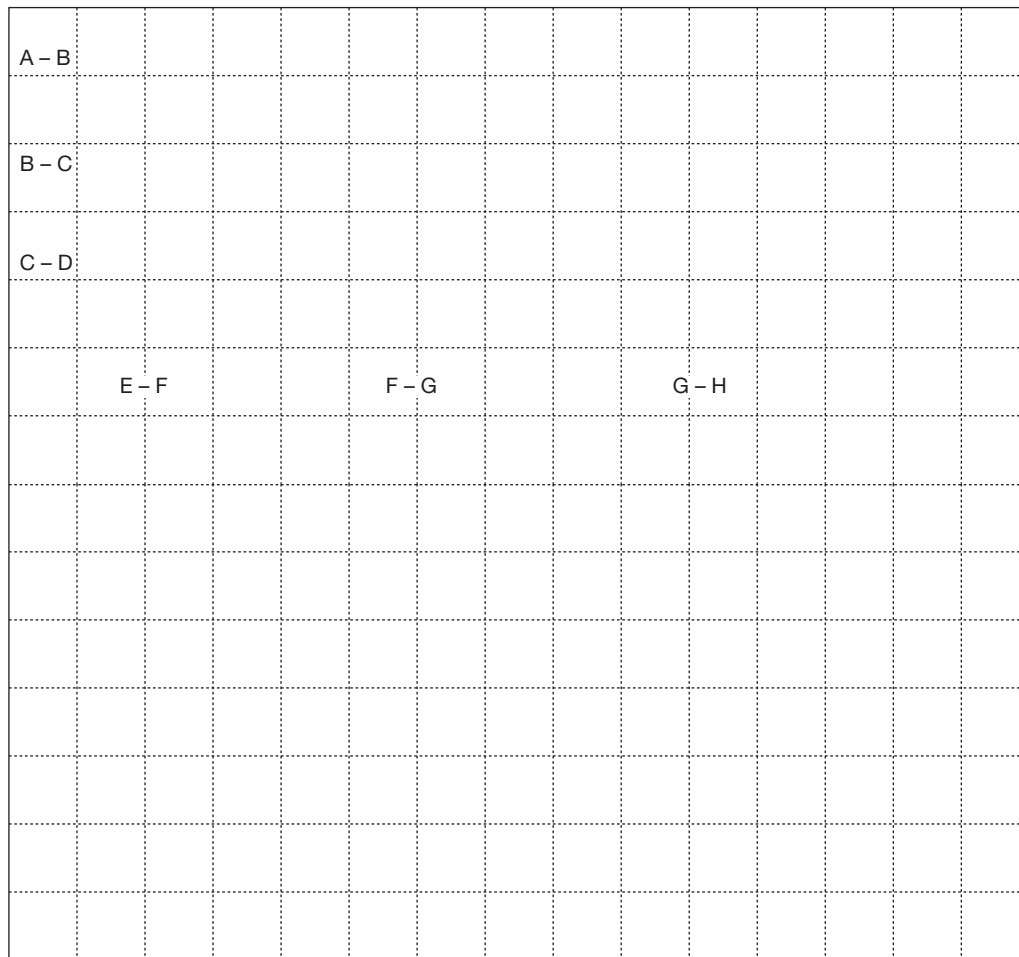


Scale: 1 grid space = 5 metres

(a) Draw diagrams to show the following vector additions.



(b) Draw diagrams to show the following vector subtractions.



1.3.2.2 Vector X is 12 N right, vector Y is 8 N left, and vector Z is 17 N left. What is:

- (a) $X + Y + Z?$
- (b) $X - Y - Z?$
- (c) $Y - Z + X?$

1.3.2.3 A vector of magnitude 6 units is added to a second vector of magnitude 5 units. What are the maximum and minimum possible values for this addition? Justify your answer.

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1.3.3 Resolve vectors into perpendicular components along chosen axes. © IBO 2007

1.3.3.1 The resultant vector (R) in each diagram represents the initial velocity of a projectile. Use the diagrams and the additional information to find the missing quantities in the table.

	Diagram	Angle	Resultant	Horizontal component	Vertical Component	Answers
(a)		30°	6	A	B	A = B =
(b)		45°	C	10.6	D	C = D =
(c)		E	10	0	F	E = F =
(d)		120°	G	H	21.65	G = H =
(e)		I	J	12.95	12.5	I = J =
(f)		K	7.5	L	2.57	K = L =
(g)		$36^\circ 25'$	M	N	14.65	M = N =
(h)		O	72.05	42.65	P	O = P =
(i)		$15^\circ 12'$	Q	0.66	R	Q = R =
(j)		S	236	T	143.7	S = T =