

1.3 Vectors & Scalars

Question Paper

Course	DPIB Physics
Section	1. Measurement & Uncertainties
Topic	1.3 Vectors & Scalars
Difficulty	Medium

Time allowed: 20
Score: /10
Percentage: /100

Question 1

Velocity is a vector quantity, so can be represented by a vector arrow. Which quantity is represented by the length of its vector arrow?

- A. Speed
- B. Magnitude
- C. Acceleration
- D. Distance

[1 mark]

Question 2

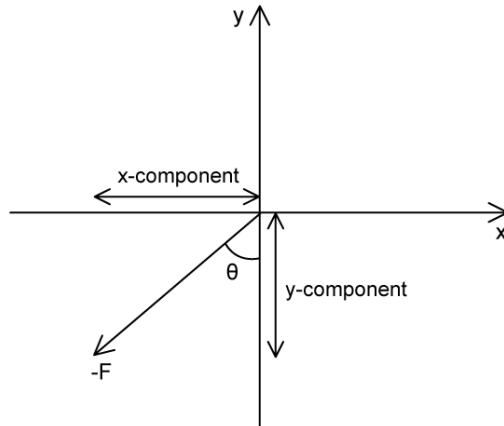
Which of the following represents correct vector and scalar quantities?

	vectors	scalars
A.	Electric charge	Weight
B.	Impulse	Current
C.	Temperature	Pressure
D.	Time	Work done

[1 mark]

Question 3

Which of the following represents the correct values of the x-component and y-component of the vector $-F$?

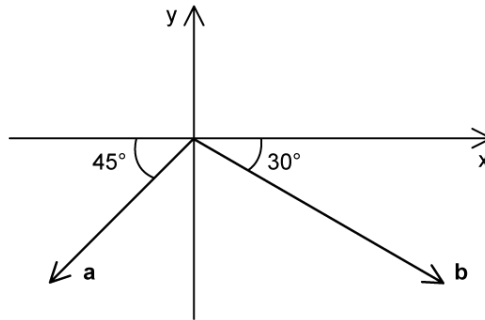


	x-component	y-component
A.	$-F \sin \theta$	$-F \cos \theta$
B.	$-F \cos \theta$	$-F \tan \theta$
C.	$F \sin \theta$	$-F \cos \theta$
D.	$-F \cos \theta$	$-F \sin \theta$

[1 mark]

Question 4

The magnitude of **a** is 15 N and that of **b** is 30 N.



Which of the following represents the correct resultant horizontal and vertical components of the vectors in the diagram?

	Horizontal Component	Vertical Component
A.	$15\sqrt{3} - 7.5\sqrt{2}$ N	$15 - 7.5\sqrt{2}$ N
B.	$15\sqrt{3} - 7.5\sqrt{2}^\circ$	$-15 - 7.5\sqrt{2}^\circ$
C.	$15\sqrt{3} - 7.5\sqrt{2}$ N	$-15 - 7.5\sqrt{2}$ N
D.	$-15 - 7.5\sqrt{2}$ N	$15 - 7.5\sqrt{2}$ N

You may use the fact that:

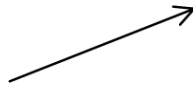
$$\cos(30) = \frac{\sqrt{3}}{2} \text{ and } \cos(45) = \frac{\sqrt{2}}{2}$$

$$\sin(30) = \frac{1}{2} \text{ and } \sin(45) = \frac{\sqrt{2}}{2}$$

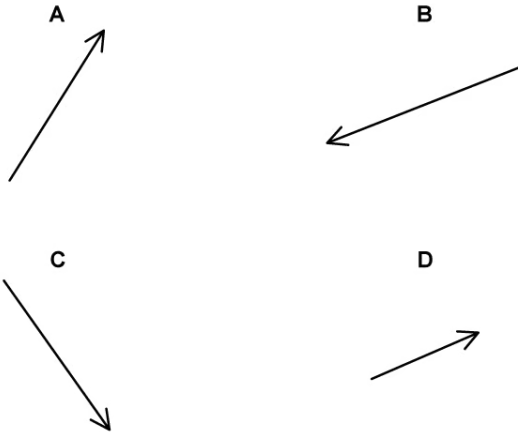
[1 mark]

Question 5

The diagram shows vector \mathbf{p} .



In which of the following diagrams is vector \mathbf{p} multiplied by a scalar represented?

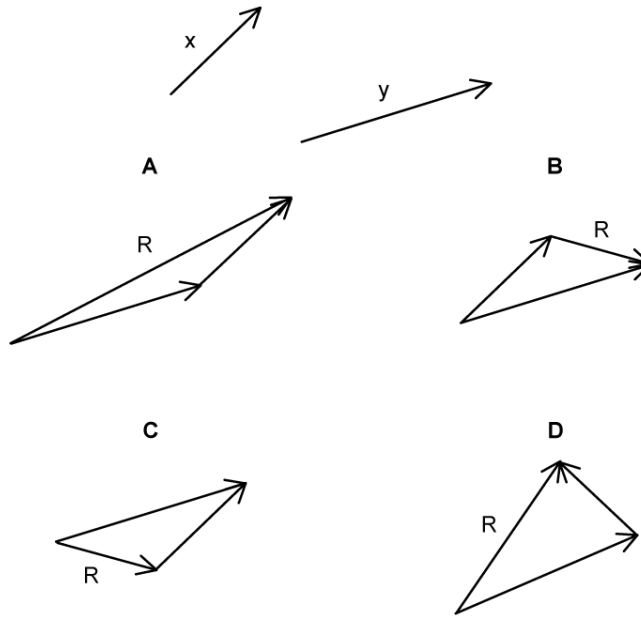


- A. 1 and 4
- B. 2 only
- C. 2 and 4
- D. 1 only

[1 mark]

Question 6

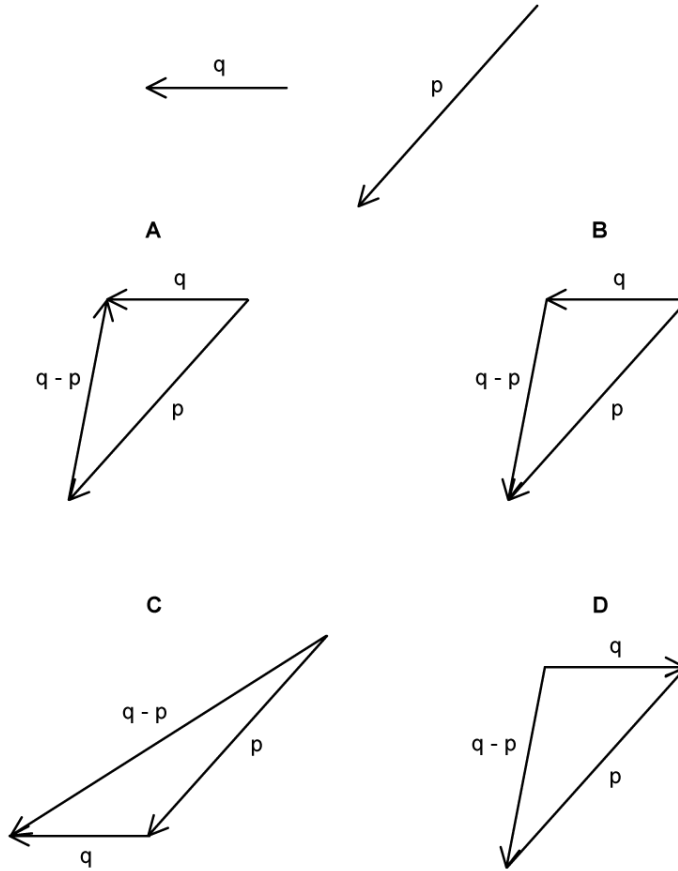
In which of the following diagrams is the addition of vectors x and y represented?



[1 mark]

Question 7

In which of the following diagrams is $\mathbf{q} - \mathbf{p}$ represented correctly?



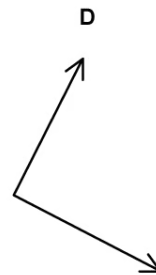
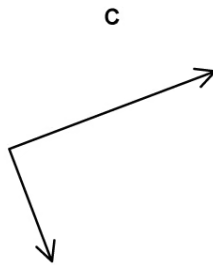
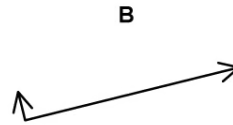
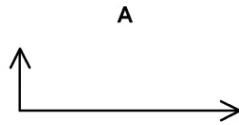
[1 mark]

Question 8

The arrow represents the vector \mathbf{R} .



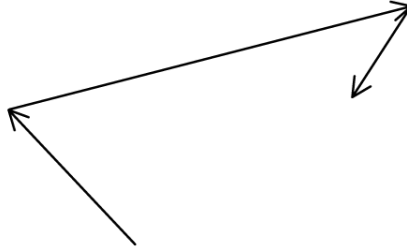
Which diagram does **not** represent \mathbf{R} as two perpendicular components?



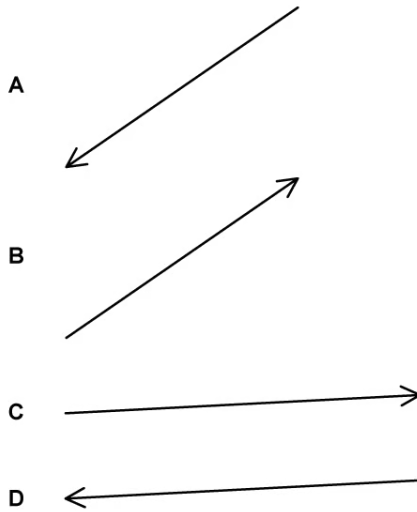
[1 mark]

Question 9

Three forces act on a body as shown.



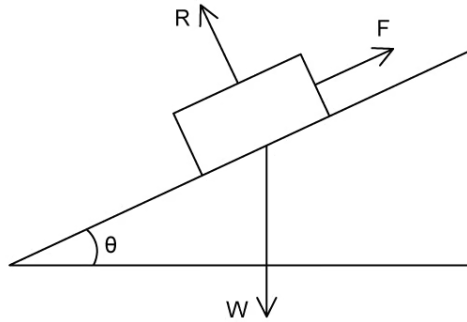
Which fourth force is required so that the resultant force is zero?



[1 mark]

Question 10

A rectangular object sits at rest on a plane inclined at angle θ to the horizontal.



R is the normal force, W is the weight and F is friction.

Which row correctly labels R and F in terms of mass m and acceleration due to gravity g .

	R	F
A.	mg	mg
B.	$mg \cos \theta$	0
C.	$mg \sin \theta$	$mg \cos \theta$
D.	$mg \cos \theta$	$mg \sin \theta$

[1 mark]