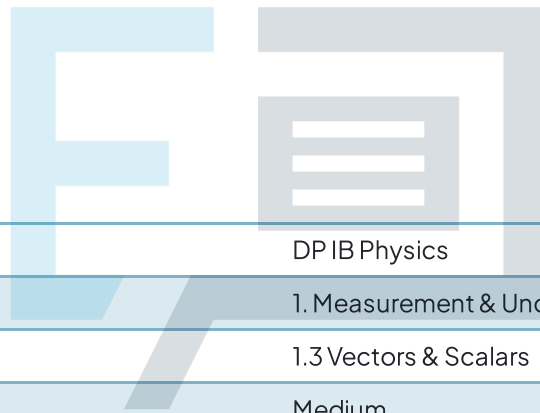




# 1.3 Vectors & Scalars

## Question Paper



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

# Exam Papers Practice

To be used by all students preparing for DP IB Physics SL  
Students of other boards may also find this useful

### 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?

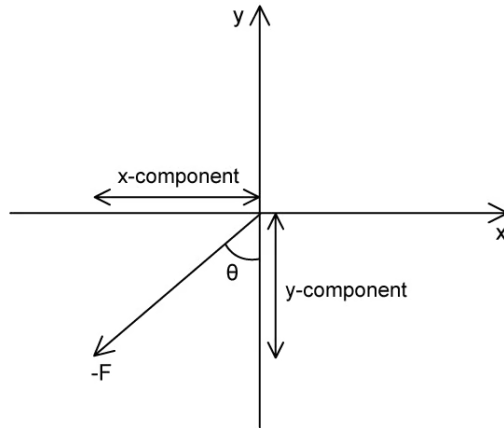
	vectors	scalars
A.	Electric charge	Weight
B.	Impulse	Current
C.	Temperature	Pressure
D.	Time	Work done

[1 mark]

# Exam Papers Practice

### Question 3

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

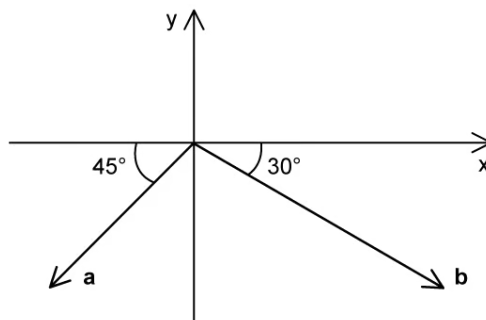


	x-component	y-component
A.	$-F \sin \theta$	$-F \cos \theta$
B.	$-F \cos \theta$	$-F \tan \theta$
C.	$F \sin \theta$	$-F \cos \theta$
D.	$-F \cos \theta$	$-F \sin \theta$

[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:

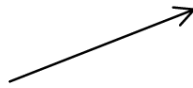
Exam Papers Practice
 $\cos(30) = \frac{\sqrt{3}}{2}$  and  $\cos(45) = \frac{\sqrt{2}}{2}$

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

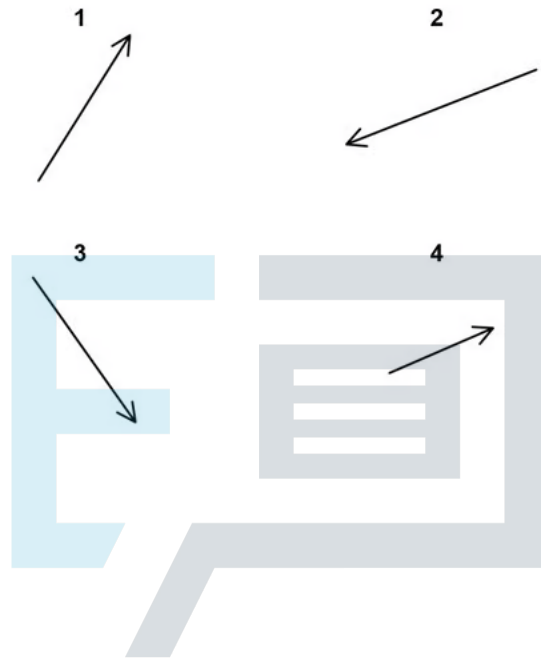
[1 mark]

### Question 5

The diagram shows vector  $\mathbf{p}$ .



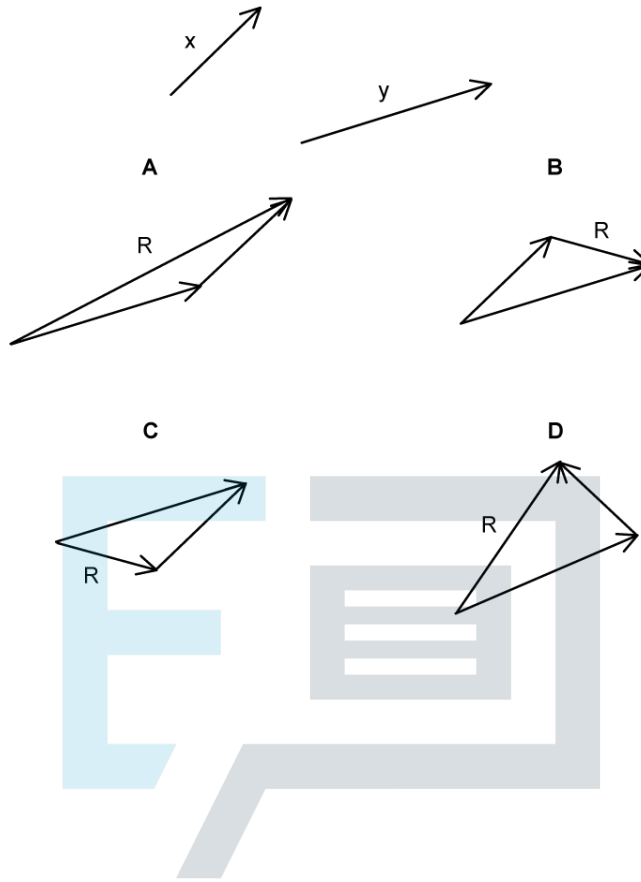
In which of the following diagrams is vector  $\mathbf{p}$  multiplied by a scalar represented?



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

**Question 6**

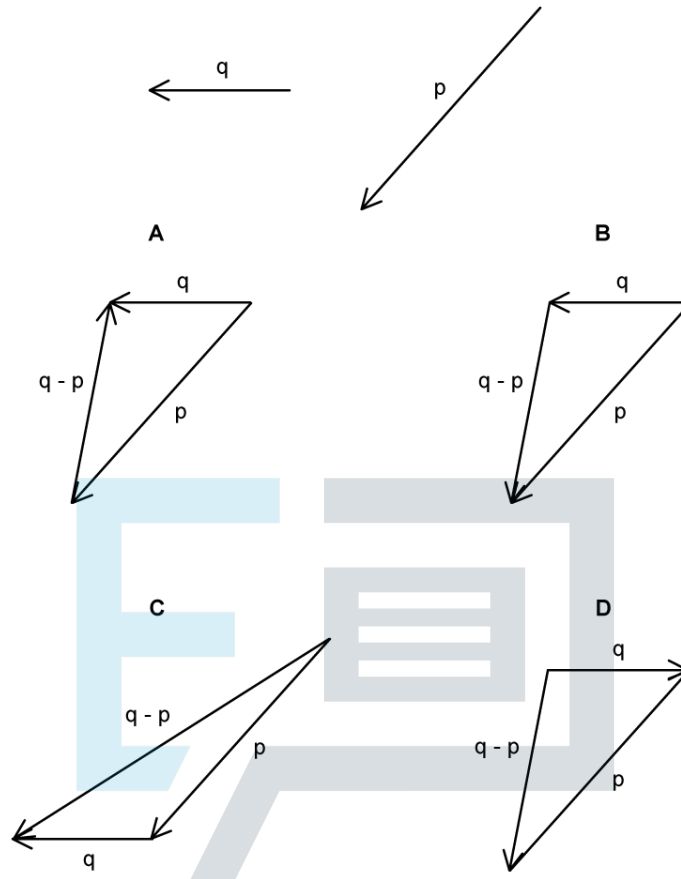
In which of the following diagrams is the addition of vectors  $x$  and  $y$  represented?



[1 mark]

**Question 7**

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



[1 mark]

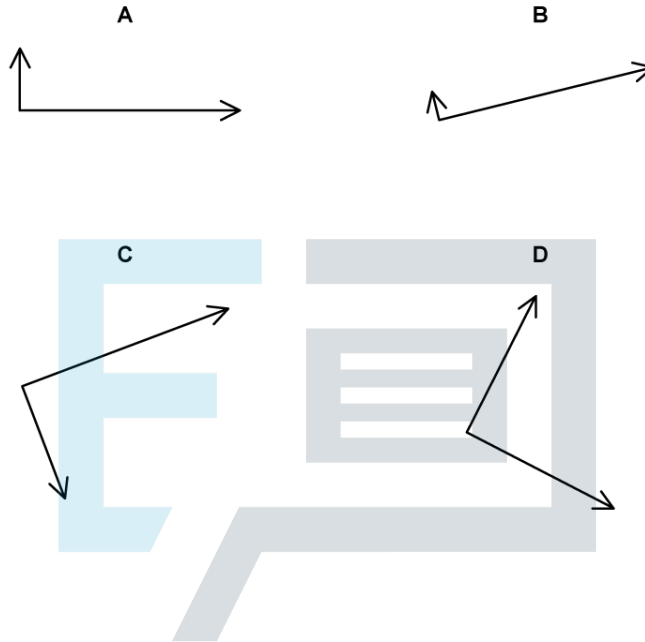
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### Question 8

The arrow represents the vector  $\mathbf{R}$ .



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

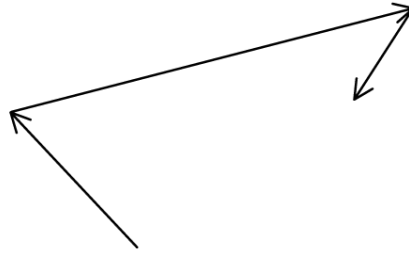


[1 mark]

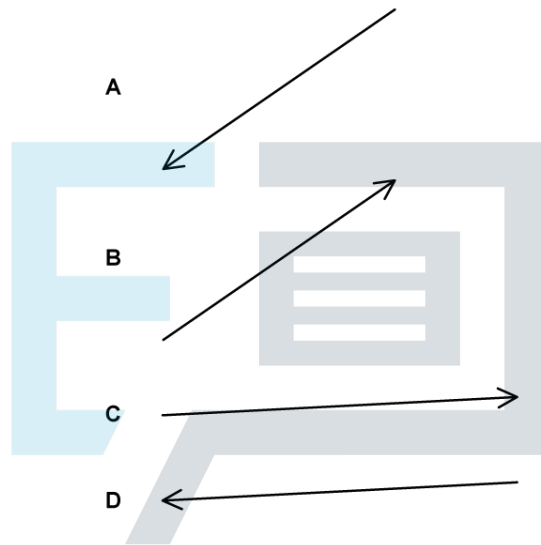


**Question 9**

Three forces act on a body as shown.



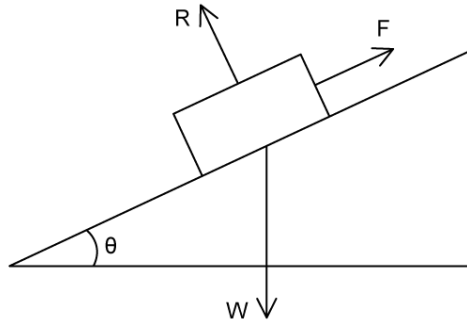
Which fourth force is required so that the resultant force is zero?



**Exam Papers Practice** [1 mark]

**Question 10**

A rectangular object sits at rest on a plane inclined at angle  $\theta$  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  $g$ .

	<b>R</b>	<b>F</b>
<b>A.</b>	$mg$	$mg$
<b>B.</b>	$mg \cos \theta$	0
<b>C.</b>	$mg \sin \theta$	$mg \cos \theta$
<b>D.</b>	$mg \cos \theta$	$mg \sin \theta$

[1 mark]