

2
SECTION A

You should spend a maximum of 40 minutes on this section.

Write your answer for each question in the box provided.

Answer **all** the questions.

1 Which pair contains one vector and one scalar quantity?

- | | | |
|---|----------------|--------------|
| A | velocity | acceleration |
| B | displacement | force |
| C | kinetic energy | work done |
| D | momentum | distance |

Your answer

[1]

2 The unit of electrical resistance is the ohm Ω . 1Ω is the same as

- A 1 C V^{-1}
- B 1 S^{-1}
- C $1 \text{ C}^2 \text{ J}^{-1} \text{ s}^{-1}$
- D 1 A V^{-1}

Your answer

[1]

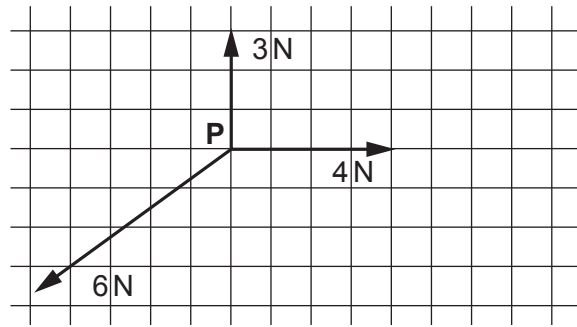
3 Which quantity is followed by a reasonable estimate of its order of magnitude?

- | | | |
|---|-----------------------------------|---------------------|
| A | weight of an apple | 10^0 N |
| B | volume of a table tennis ball | 10^3 cm^3 |
| C | wavelength of infra-red radiation | 10^4 m |
| D | temperature of Sun's surface | 10^5 K |

Your answer

[1]

11 The three forces in this vector diagram act in one plane on an object P.



What is the magnitude and direction of the resultant?

- A 1 N ↙
- B 1 N ↗
- C 1 N →
- D 11 N ↙

Your answer

[1]

12 A car travelling at 10 ms^{-1} is brought to rest in a braking distance of 10 m.

Using the same average braking force, in what distance can the car be brought to rest from a speed of 40 ms^{-1} ?

- A 20 m
- B 40 m
- C 80 m
- D 160 m

Your answer

[1]

- (c) A constant force of 300 N strikes the sail of a land yacht at an angle of 50° to the direction of motion of the vehicle as shown in Fig. 3.2. The mass of the yacht and rider is 135 kg.

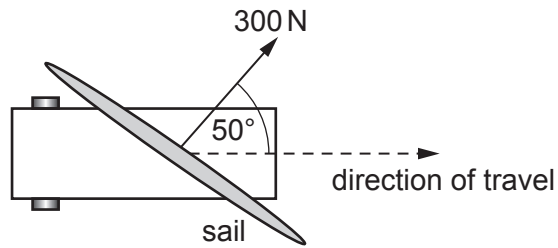


Fig. 3.2

Calculate the time for the land yacht to travel 50 m in the direction shown. The yacht starts from rest. Ignore resistive forces.

time = s [4]

- 4 An image sent from Pluto to Earth is 1024×1024 pixels. Each pixel is coded by 12 bits. The data is transferred at a rate of 200 bytes per second.

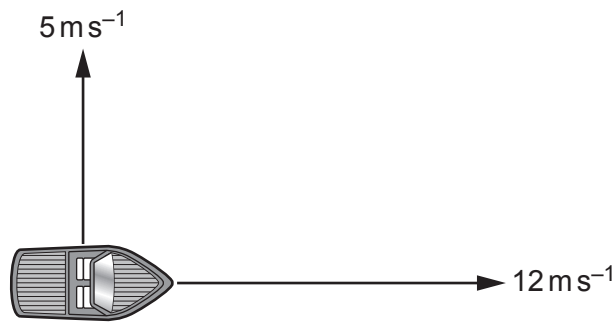
How long does it take to transmit the data?

- A 11 minutes
- B 87 minutes
- C 131 minutes
- D 1049 minutes

Your answer

[1]

- 5 A boat travels eastwards with a velocity of 12 ms^{-1} . A current from the south pushes the boat northwards at a velocity of 5 ms^{-1} .



What is the magnitude of the resultant velocity of the boat?

- A 7 ms^{-1}
- B 13 ms^{-1}
- C 17 ms^{-1}
- D 169 ms^{-1}

Your answer

[1]

24 A ball is kicked from horizontal ground at a velocity of 15 ms^{-1} at an angle of 20° to the horizontal.

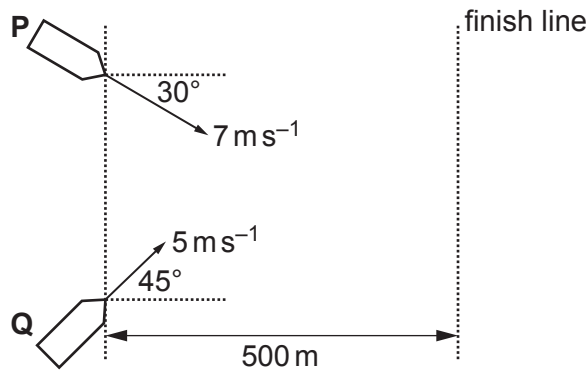
How long will the ball remain in the air before hitting the ground?
Ignore any effects of air resistance.

- A 0.5s
- B 1.0s
- C 1.4s
- D 2.9s

Your answer

[1]

25 The diagram shows two boats **P** and **Q** sailing at constant velocity towards the finish line.



Which statement is correct?

- A Boat **P** wins by 1.4s.
- B Boat **Q** wins by 29s.
- C Boat **P** wins by 59s.
- D Boat **Q** wins by 198s.

Your answer

[1]