A thermometer can be read to an accuracy of ±0.5 °C. This thermometer is used to measure a temperature rise from 40 °C to 100 °C.

What is the percentage uncertainty in the measurement of the temperature rise?

A 0.5% **B** 0.8% **C** 1.3% **D** 1.7%

if 40 ± 0.5 to 100 ± 0.5

$\pm 1\,°C$

So $\frac{1}{69} \times 100 = \boxed{1.7}$

A student makes measurements from which she calculates the speed of sound as 327.66 m s^{-1}. She estimates that her result is accurate to ±3 %.

Which of the following gives her result expressed to the appropriate number of significant figures?

A 327.7 m s^{-1} **B** 328 m s^{-1} **C** 330 m s^{-1} **D** 300 m s^{-1}

* How did it come to the conclusion of C ?

Which experimental technique reduces the systematic error of the quantity being investigated?

A adjusting an ammeter to remove its zero error before measuring a current

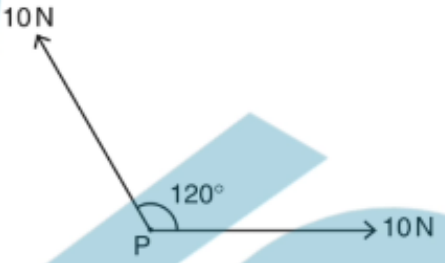
B measuring several internodal distances on a standing wave to find the mean internodal distance

C measuring the diameter of a wire repeatedly and calculating the average

D timing a large number of oscillations to find a period

- Remember that Systamic erros can be fixed by:
+ Fixing Apparatus
+ Fixing techniques
✓ BCD describe Random

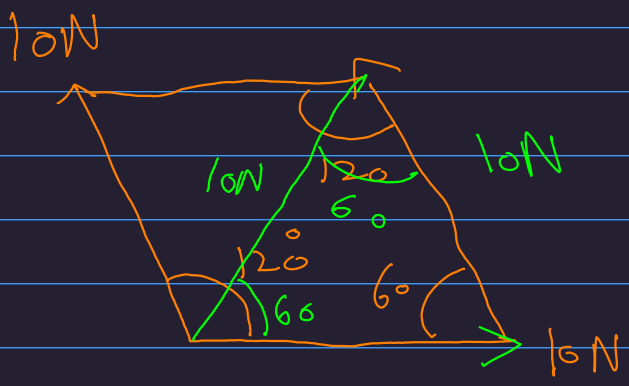
Two forces, each of 10 N, act at a point P as shown in the diagram. The angle between the directions of the forces is 120°.



What is the magnitude of the resultant force?

What is the magnitude of the resultant force?

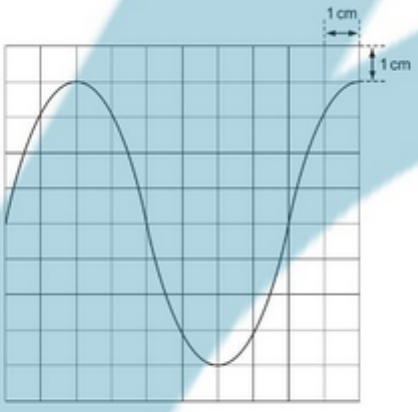
A 5 N **B** 10 N **C** 17 N **D** 20 N



$$\frac{360 - 240}{2} = 60$$

$$\therefore = 10\,N$$

When a 12 V 50 Hz supply is connected to the Y-terminals of an oscilloscope, the trace in the diagram is obtained.



What is the setting of the time-base control?

A 2.0 ms cm^{-1} **B** 2.5 ms cm^{-1} **C** 5 ms cm^{-1} **D** 20 ms cm^{-1}

0.025 – 1 cycle

$25\,ms$ – 12.5 cycle

$$\frac{25}{10} = 2.5\,ms$$

In a simple electrical circuit, the current in a resistor is measured as (2.50 ± 0.05) mA. The resistor is marked as having a value of 4.7 Ω ± 2%.

If these values were used to calculate the power dissipated in the resistor, what would be the percentage uncertainty in the value obtained?

A 2% **B** 4% **C** 6% **D** 8%

* Another way of calculating Uncertainty

Original: $P = (2.5)^2 \times 4.7$ (Note difference between percent & value)

$= 29.3 \ldots$

Measured: $P = (2.5 + 0.05)^2 \times 4.7 \times 1.02$

$= 33.03$

$\frac{33.03}{29.3} = (1.06 - 1) \times 100 = 6\%$

In an experiment, a radio-controlled car takes 2.50 ± 0.05 s to travel 40.0 ± 0.1 m.

What is the car's average speed and the uncertainty in this value?

A $16 \pm 1\ m\ s^{-1}$

B $16.0 \pm 0.2\ m\ s^{-1}$

C $16.0 \pm 0.4\ m\ s^{-1}$

D $16.00 \pm 0.36\ m\ s^{-1}$

$\frac{40.1}{2.48} = 16.36$

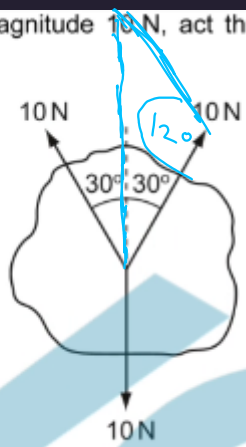
16 ± 0.36

~ 0.4 ?

Which row of the table shows a physical quantity and its correct unit?

	physical quantity	unit
A	electric field strength	$kg\ m\ s^{-2}\ C^{-1}$
B	specific heat capacity	$kg^{-1}\ m^2\ s^{-2}\ K^{-1}$
C	tensile strain	$kg\ m^{-1}\ s^{-2}$
D	the Young modulus	$kg\ m^{-1}\ s^{-3}$

Three coplanar forces, each of magnitude 10 N, act through the same point of a body in the directions shown.



What is the magnitude of the resultant force?

A 0 N **B** 1.3 N **C** 7.3 N **D** 10 N

$R_1 = 10^2 \times 10^2 - 2 \times 10 \times 10 \times \cos(120)$

$R = R_1 - R_2 = 10\sqrt{3} - 10$

$= 7.3$

$\frac{V + 3Y}{I + 2Y}$

$\frac{}{4}$