

OCR GCSE Mathematics Non-Calculator 2021 Higher Paper 2 Revision Worksheet

Questions 9–18

9

A worker received a 10% pay increase in 2017 and a further 10% pay increase in 2018.

The worker says

Over these two years, my pay increased by $10\% + 10\% = 20\%$.

The worker is incorrect.

Work out the correct percentage increase. You must show your working.

..... [5]

10

Force is measured in newtons (N). A force of 198.5 N is applied to a rectangular surface of length 4.9 cm and width 4.1 cm.

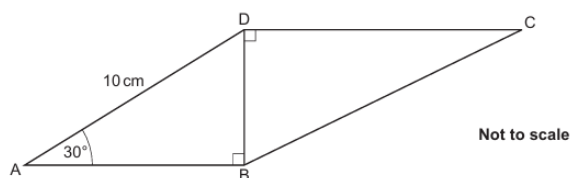
Work out an estimate of the pressure, in N/cm^2 , applied to this rectangular surface.

[The formula for pressure is: Pressure = Force / Area]

..... N/cm^2 [4]

11

The diagram shows a quadrilateral ABCD.



$AD = 10 \text{ cm}$, angle $BAD = 30^\circ$ and angle $ABD = \text{angle } BDC = 90^\circ$.

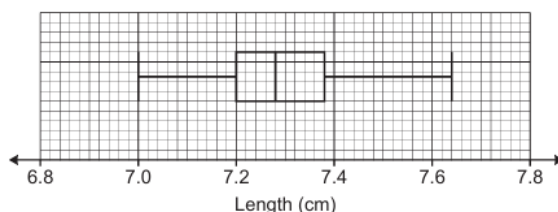
The ratio of length BD to length DC is 1 : 2 : 4

Work out length BC. You must show your working.

..... cm [7]

12

The box plot shows the distribution of the lengths, in cm, of 60 full-grown mice owned by a pet shop.



(a) Find the range.

(b) Work out the number of these mice that have a length of at least 7.2 cm.

(c) Sam owns 5 full-grown mice. Sam picks the third longest mouse and measures its length. Sam then looks at the box plot. Sam says

This mouse is 7.35cm long. Therefore, the mice I own are longer than the full-grown mice owned by the pet shop.

(i) Give a mathematical reason to support Sam's conclusion.

..... [1]

(ii) Give a mathematical reason why Sam's conclusion may be unreliable.

..... [1]

13

(a) Write $\frac{3}{11}$ as a recurring decimal. (a) [2]

(b) Write as a fraction in its simplest form. (b) [3]

14

Two solid ornaments are mathematically similar. The larger ornament is twice as tall as the smaller ornament. The smaller ornament has a volume of 50 cm^3 .

Work out the volume of the larger ornament.

..... cm^3 [2]

15

Write $\sqrt{20} + \sqrt{45}$ in the form $k\sqrt{5}$.

16

In a group of 60 students, 40 own a smartphone, 27 own a tablet and 8 own neither. A student is chosen at random from those that own a tablet.

Find the probability that they also own a smartphone. You must show your working.

..... [5]

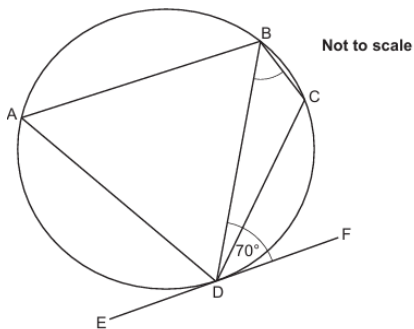
17

Simplify fully. $\frac{2x^2 - 50}{x^2 + 7x + 10}$

18

A, B, C and D are points on the circumference of a circle.

EF is the tangent to the circle at D.



The ratio angle BCD : angle CBD is 5 : 2.

Work out angle CBD. You must show your working.

..... ° [5]