

9 September 2019

Homework

1. Calculate $3.7 \times 16.2^2 - 500$, writing your answer
- (a) correct to two decimal places;
 - (b) (i) correct to three significant figures;
(ii) in the form $a \times 10^k$, where $1 \leq a < 10$, $k \in \mathbb{Z}$.

*Working:**Answers:*

- (a)
- (b) (i)
(ii)

(Total 4 marks)

2. (a) A girl's height is 1.623 m. Write her height **to the nearest cm**.
- (b) The time taken to fill a tank was 2 hours 43 minutes. Write this time **to the nearest 5 minutes**.
- (c) The attendance at a show was 2591 people. How many people, **to the nearest 100**, were at the show?
- (d) The mean distance of the Moon from the Earth is approximately 384 403 km. Write this distance in the form $a \times 10^k$ where $1 \leq a < 10$ and $k \in \mathbb{Z}$.

Working:

Answers:

- (a)
- (b)
- (c)
- (d)

(Total 4 marks)

3. Anthony uses the formula

$$p = \frac{27q}{r + s}$$

to calculate the value of p when, correct to two decimal places, $q = 0.89$, $r = 1.87$ and $s = 7.22$.

- (a) He estimates the value **without using a calculator**.
 - (i) Write down the numbers Anthony could use in the formula to estimate the value of p .
 - (ii) Work out the estimate for the value of p that your numbers would give.
- (b) A calculator is to be used to work out the actual value of p .

To what degree of accuracy would you give your calculator answer? Give a reason for your answer.

Working:

Answers:

- (a) (i)
- (ii)
- (b)
.....

(Total 4 marks)

4. If $x = 3.1 \times 10^4$ and $y = 2.4 \times 10^{-7}$, calculate the values of the following, expressing your answers in the form $a \times 10^k$, where $1 \leq a < 10$ and $k \in \mathbb{Z}$.

(a) x^2

(b) $\frac{x}{y}$

Working:

Answers:

(a)

(b)

(Total 4 marks)

5. The speed of sound in air is given as 300 ms^{-1} .

(a) How many meters does sound travel in air in one hour?

(b) Express your answer to part (a)

(i) correct to **two** significant figures;

(ii) in the form $a \times 10^k$, where $1 \leq a < 10$ and $k \in \mathbb{Z}$.

Working:

Answers:

(a)

(b) (i)

(ii)

(Total 4 marks)

6. A rectangle has length 2.6×10^4 and width 1.9×10^4 . Find each of the following, giving your answer in the form $a \times 10^k$, where $1 \leq a < 10$ and $k \in \mathbb{Z}$.

- (a) The area of the rectangle;
- (b) The perimeter of the rectangle.

Working:

Answers:

(a)

(b)

(Total 8 marks)

September 13, 2016**Homework (pretest packet, part 2)**

7. Let $x = 6.4 \times 10^7$ and $y = 1.6 \times 10^8$.

Find

(a) $\frac{x}{y}$

(b) $y - 2x$,

giving your answers in the form $a \times 10^k$ where $1 \leq a < 10$ and $k \in \mathbb{Z}$.

Working:

Answers:

(a)

(b)

(Total 8 marks)

8. Using the formula $V = \pi r^2 (H - h)$, and your calculator value of π , calculate the value of V when $r = 4.26$, $H = 21.58$ and $h = 14.35$.

- (a) Give the full calculator display.
- (b) Give your answer to two decimal places.
- (c) Give your answer to two significant figures.
- (d) Write your answer to part (c) in the form $a \times 10^k$ where $1 \leq a < 10$ and $k \in \mathbb{Z}$.

Working:

Answers:

- (a)
- (b)
- (c)
- (d)

(Total 8 marks)

9. Arthur needs to calculate a value from a trigonometric formula. He uses his calculator to find the value of r given by $r =$

$$\frac{1}{\sin(86^\circ) - \sin(85^\circ)}$$

- (a) Calculate the value of r , correct to three significant figures.
- (b) Arthur makes the mistake of rounding both of the sines to three significant figures **before** taking their difference. Calculate the value of r found by Arthur. Call this value r_A .
- (c) Calculate the percentage error E in Arthur's calculation, given by the formula

$$E = \frac{100(r - r_A)}{r}.$$

Working:

Answers:

- (a)
- (b)
- (c)

(Total 8 marks)

10. The total weight of 256 identical pencils is 4.24 kg. Calculate the weight of one pencil, in kg.

- (a) Give your answer exactly.
- (b) Give your answer correct to three significant figures.
- (c) Write your answer to part (b) in the form $a \times 10^k$ where $1 \leq a < 10$ and $k \in \mathbb{Z}$.

Working:

Answers:

- (a)
- (b)
- (c)

(Total 8 marks)

11. A field is 91.4 m long and 68.5 m wide.

- (a) Calculate the area of the field in m^2 .
- (b) Calculate the area of the field in cm^2 .
- (c) Express your answer to (b) in the form $a \times 10^k$ where $1 \leq a < 10$ and $k \in \mathbb{Z}$.

Working:

Answers:

(a)

(b)

(c)

(Total 6 marks)

12. Arthur needs to calculate a value from a trigonometric formula. He uses his calculator to find the value of r given by $r =$

$$\frac{1}{\cos(4^\circ) - \cos(5^\circ)}$$

- (a) Calculate the value of r , correct to three significant figures.
- (b) Arthur makes the mistake of rounding both of the cosines to three significant figures **before** taking their difference. Calculate the value of r found by Arthur. Call this value r_A .
- (c) Calculate the relative error E in Arthur's calculation, given by the formula

$$E = \left| \frac{r - r_A}{r} \right|$$

Working:

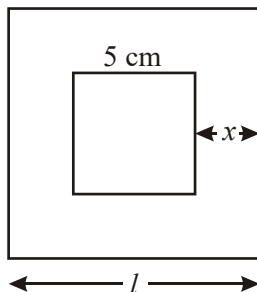
Answers:

- (a)
- (b)
- (c)

(Total 8 marks)

September 13, 2016**Homework (Modeling with functions)**

1. A picture is in the shape of a square of side 5 cm. It is surrounded by a wooden frame of width x cm, as shown in the diagram below.



The length of the wooden frame is l cm, and the area of the wooden frame is A cm².

- (a) Write an expression for the length l in terms of x .

(1)

- (b) Write an expression for the area A in terms of x .

(2)

- (c) If the area of the frame is 24 cm², find the value of x .

(4)
(Total 7 marks)