9 September 2019

**Homework**

**1.** Calculate 3.7 × 16.22 – 500, writing your answer

(a) correct to two decimal places;

(b) (i) correct to three significant figures;

(ii) in the form *a* × 10*k*,where 1 ≤ *a* < 10, *k*  .

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| --- | --- |
| *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* × 10*k* where 1 ≤ *a* < 10 and *k*  .

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| *Working:* |  |
|  | *Answers*:  (a) …………………………………………..  (b) …………………………………………..  (c) …………………………………………..  (d) …………………………………………... |

(Total 4 marks)

**3.** Anthony uses the formula

*p* = 

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.

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| *Working:* |  |
|  | *Answers*:  (a) (i) ……………………………………...  (ii) ……………………………………..  (b) ..................................................................  .................................................................. |

(Total 4 marks)

**4.** If *x* = 3.1 × 104 and *y* = 2.4 × 10–7, calculate the values of the following, expressing your answers in the form *a* × 10*k*, where 1 ≤ *a* < 10 and  .

(a) *x*2

(b) 

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| --- | --- |
| *Working:* |  |
|  | *Answers*:  (a) …………………………………………..  (b) .................................................................. |

(Total 4 marks)

**5.** The speed of sound in air is given as 300 *ms*–l.

(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* × 10*k*, where 1 ≤ *a* < 10 and *k*  .

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| *Working:* |  |
|  | *Answers*:  (a) …………………………………………..  (b) (i) ……………………………………...  (ii) ……………………………………... |

(Total 4 marks)

**6.** A rectangle has length 2.6 × 104 and width 1.9 × 104. Find each of the following, giving your answer in the form *a* × 10*k*, where 1  *a* < 10 and *k*  .

(a) The area of the rectangle;

(b) The perimeter of the rectangle.

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| *Working:* |  |
|  | *Answers*:  (a) …..….………………………  (b) ……………………………... |

(Total 8 marks)

**September 13, 2016**

**Homework (pretest packet, part 2)**

**7.** Let *x* = 6.4 × 107 and *y* = 1.6 × 108.

Find

(a) 

(b) *y* – 2*x*,

giving your answers in the form *a* × 10*k* where 1  *a* < 10 and *k*  .

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| *Working:* |  |
|  | *Answers*:  (a) …………………………………………..  (b) .................................................................. |

(Total 8 marks)

8. Using the formula *V* = *r*2 (*H* – *h*), and your calculator value of , 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* × 10*k* where 1 ≤ a < 10 and *k*  .

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| *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* =



.

(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 *rA*.

(c) Calculate the percentage error *E* in Arthur's calculation, given by the formula

*E = *

|  |  |
| --- | --- |
| *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* × 10*k* where 1 ≤ *a* < 10 and *k*  .

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| *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 m2.

(b) Calculate the area of the field in cm2.

(c) Express your answer to (b) in the form *a* × 10*k* where 1 ≤ *a* < 10 and *k*  .

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| *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* =



(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 *rA*.

(c) Calculate the relative error *E* in Arthur's calculation, given by the formula



|  |  |
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| *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)