|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AQA-logo-black | General Certificate of Secondary Education   |  |  | | --- | --- | | For Examiner’s Use | | | Pages | Mark | | 3 |  | | 4 – 5 |  | | 6 – 7 |  | | 8 – 9 |  | | 10 – 11 |  | | 12 – 13 |  | | 14 – 15 |  | | 16 |  | | TOTAL |  |   Higher Tier |

**Mathematics (Linear) B**

**4365/1H**

**Paper 1 Non-calculator**

**HF**

**Practice Paper 2012 Specification (Set 2)**

**For this paper you must have:**

* mathematical instruments.

You must **not** use a calculator.

* mathematical instruments.

You may use a calculator.

You may use a calculator.



Time allowed

* 1 hour 30 minutes

Instructions

* Use black ink or black ball-point pen. Draw diagrams in pencil.
* Fill in the boxes at the top of this page.
* Answer **all** questions.
* You must answer the questions in the spaces provided. Do not write outside

the box around each page or on blank pages.

* Do all rough work in this book. Cross through any work that you do not want to

be marked.

Information

* The marks for questions are shown in brackets.
* The maximum mark for this paper is 70.
* The quality of your written communication is specifically assessed

in questions 3 and 17.

These questions are indicated with an asterisk (🟎).

* You may ask for more answer paper, graph paper and tracing paper.  
  These must be tagged securely to this answer booklet.

Advice

* In all calculations, show clearly how you work out your answer.

**4365/1H**

|  |
| --- |
| **Formulae Sheet: Higher Tier**  **Area of trapezium** = (*a* + *b*)*h*  *h*  *a*  *b*  **Volume of sphere** = π*r* 3  **Surface area of sphere** = 4π*r* 2  *r*  **Volume of cone** = π*r* 2 *h*  **Curved surface area of cone** = π*r* *l*  **In any triangle** *ABC*  **Area of triangle** = *ab* sin *C*  **Sine rule**  =  =  **Cosine rule** *a* 2 = *b* 2 + *c* 2 – 2*bc* cos *A*  **The Quadratic Equation**  The solutions of *ax* 2 + *bx* + *c* = 0, where *a* ≠ 0, are given by  *x* =  *A*  *B*  *C*  *a*  *b*  *c*  *r*  *h*  *l*  **Volume of prism** = area of cross-section × length  length  cross-  section |

|  |
| --- |
| Answer **all** questions in the spaces provided.  Do not write outside the box |
| **1** Mary walks from her home to a café and back.  **4**  The distance-time graph shows her walk.      Café  Home  7  6  5  4  3  2  1  0  Distance from home  (km)  0  1  2  3  4  5  Time (hours)      **1 (a)** How far does Mary walk altogether?  ..................................…………...….…….....……………………………………………………...  Answer ..….…….....………………………………………km *(1 mark)*  **1 (b)** Mary sets off at 9 am.  What time does she arrive at the café?  ..................................…………...….…….....……………………………………………………..    Answer ..….…….....…………………………………………… *(1 mark)*  **1 (c)** Work out her average speed on the way back from the café.  ...................................…………...….…….....……………………………………………………..  ..................................…………...….…….....……………………………………………………...  Answer ..….…….....………………………………....km/h *(2 marks)* |
| **2 (a)** Complete the table showing the properties of some quadrilaterals.  Do not write outside the box  Tick or cross the columns.  The first one has been done for you.   |  |  |  |  | | --- | --- | --- | --- | | **Quadrilateral** | **Both pairs of opposite angles equal** | **All sides equal** | **Diagonals cross at right angles** | | Parallelogram | **✓** | **🗶** | **🗶** | | Trapezium |  |  |  | | Kite |  |  |  |     (*3 marks*)  **2 (b)** Draw or name this quadrilateral.   |  |  |  |  | | --- | --- | --- | --- | | **Quadrilateral** | **Both pairs of opposite angles equal** | **All sides equal** | **Diagonals cross at right angles** | |  | **✓** | **✓** | **✓** |     (*1 mark*) |
| 🟎**3** A raffle has three prizes.  Do not write outside the box  **12**  First prize is £40.  Second prize is  of the first prize.  Third prize is  of the second prize.    Raffle tickets are 50 p each.  How many tickets need to be sold to make a profit of £70?  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..    ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  Answer ………………………………………....... (*5 marks*)  **4** The average speed of a car is 50 miles per hour (mph).  A journey is 400 kilometres (km).  How long will the journey last?  State any conversions you use.  ………………………………………………………………………………………………..............  ………………………………………………………………………………………………..............  ………………………………………………………………………………………………..............  Answer ……………………..………........ hours (*3 marks*) |
| **5** The mode of five numbers is 3.  Do not write outside the box  The median is 7.  The mean is 6.  Work out the five numbers.  ………………………………………………………………………………………….....................  ………………………………………………………………………………………….....................  ………………………………………………………………………………………….....................  ………………………………………………………………………………………….....................  ………………………………………………………………………………………….....................  …………………………………………………………………………..………………...................  Answer ………. , ………. , …..….. , ………. , ………. (*3 marks*)  **6** Work out the area of the trapezium.  5 cm  Not drawn  accurately  4 cm  9 cm    ………………………………………………………………………………………….....................  ………………………………………………………………………………………….....................  ………………………………………………………………………………………….....................  Answer …………………………………….…… cm2 (*2 marks*) |
| **7**  **7** The costs and distances for 10 coach journeys are shown on the scatter diagram.  **8**  Do not write outside the box        Cost (£)  Distance (miles)  **7 (a)** Draw a line of best fit on the diagram. (*1 mark*)    **7 (b)** Estimate the cost of a journey of 175 miles.  ………………………………………………………………………..............................................  Answer £ ……………....…………………. (*1 mark*)  **7 (c)** The scatter diagram shows positive correlation.  Explain what this means for the relationship between the cost and the distance of a journey.  ………………………………………………………………………………...................................  ………………………………………………………………………………...................................  (*1 mark*) |
| **8** An arrowhead is drawn inside a square of side 6 cm.  Do not write outside the box  *X* is the midpoint of one side.  *Y* is the centre of the square.  Not drawn accurately  *X*  *Y*  6 cm  *Y*      Work out the area of the arrowhead.    ………………………………………………………………………………………………………...  …………………………………………………………………………………………….................  ………………………………………………………………………………………………………...  Answer ……………………………………..…… cm2 (*3 marks*)  **9 (a)** Work out the highest common factor (HCF) of 30 and 80  …………………………………………………………………………………………………………  Answer ...………………………………………….…… (*1 mark*)  **9 (b)** Work out the least common multiple (LCM) of 30 and 80  …………………………………………………………………………………………………………  …………………………………………………………………………………………………………  Answer ……………………………………..………… (*2 marks*) |
| **10**  Ellie has 3000 songs on her MP3 player.  **12**  Do not write outside the box  **10 (a)** On Monday she listened to 50 songs chosen at random.  15 were rock songs.  Estimate the total number of rock songs on her MP3 player.  ..................................…………...….…….....…………………………………………..................  ..................................…………...….…….....…………………………………………..................  ..................................…………...….…….....…………………………………………..................  Answer ………………………………………….……. (*3 marks*)    **10 (b)** On Tuesday she again listened to 50 songs chosen at random.  10 were rock songs.  Give a reason why the number of rock songs was different each day.  ..................................…………...….…….....…………………………………………..................  ..................................…………...….…….....…………………………………………..................  (*1 mark*)  **11** Make *x* the subject of *y*  = 2*x* + 3  ………………………………………………………………………………………………..............  ………………………………………………………………………………………………..............  ………………………………………………………………………………………………..............  ………………………………………………………………………………………………..............    Answer …………………………………………….... (*2 marks*) |
| **12 (a)** Write down the value of  Do not write outside the box  **12 (a) (i)** 20    Answer ...…………………………………. (*1 mark*)  **12 (a) (ii)** 2–1    Answer ...…………………………………. (*1 mark*)  **12 (b)** Work out the value of 2–1 + 2–2  Give your answer as a fraction.  ………………………………………………………………………………………………...............    Answer …………………………………. (*2 marks*)  **13** Draw the region defined by the inequalities  *x* > 1  *y* > *x*  *x* + *y* < 6  Mark the region clearly with an R.  …………………………………………………………………………………………….................  …………………………………………………………………………………………….................  …………………………………………………………………………………………….................  *y*        *x*  (*3 marks*) |
| **11**  Do not write outside the box  **14** Solve the equation  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  ………………………………………………………………………………………………………..  Answer *x* = ………………………………….. (*4 marks*)  **Turn over for the next question** |
| **15** A sequence of shapes is made from centimetre squares.  Do not write outside the box  Shape 3  Shape 2  Shape 1  Shape 4    Work out an expression for the perimeter of shape *n*.  ………………………………………………………………………………………………..............  ………………………………………………………………………………………………..............  ………………………………………………………………………………………………..............  ………………………………………………………………………………………………..............  ………………………………………………………………………………………………..............  ………………………………………………………………………………………………..............      Answer ………………………………………….……. (*3 marks*)  **16** Simplify fully  ………………………………………………………………………………………………...............  ………………………………………………………………………………………………...............  ………………………………………………………………………………………………...............  …………………………………………………………………………….…………………..............    Answer ……………………………………………….. (*3 marks*) |

|  |
| --- |
| 🟎**17** *PQR* is a straight line.  Do not write outside the box  **11**  *ABCD* is a parallelogram.  *B*  *C*  Not drawn accurately  *y* + 50°  *y*  *x* + 60°  2*x* – 40°  *D*  *A*  *R*  *Q*  *P*      Use the information in the diagrams to find the values of *x* and *y*.  ………………………………………………………………………………………………...............  ………………………………………………………………………………………………...............  ………………………………………………………………………………………………...............  ………………………………………………………………………………………………...............  ………………………………………………………………………………………………...............  ………………………………………………………………………………………………...............  ………………………………………………………………………………………………...............    ………………………………………………………………………………………………...............  ………………………………………………………………………………………………...............  ………………………………………………………………………………………………...............  Answer *x* = …………………………….... degrees  *y* = ………………………….…... degrees (*5 marks*) |
| **18** A cone and a hemisphere are joined to make a toy as shown.  They both have a radius *r* cm.  The total height is 4*r* cm.    4*r* cm  Not drawn accurately    *r* cm    Do not write outside the box  The manufacturer works out a formula for the volume of the toy.  Work out this formula.  Give your answer as simply as possible in terms of *π* .  ………………………………………………………………………………………………..............  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………...........................................  Answer ………………………………………… cm3  (*4 marks*) |

|  |
| --- |
| **19** Choose two numbers: for example, 8 and 5  Subtract the smaller from the larger and square the result: (8 – 5)2 = 32  = 9  Square the numbers and add: 82 + 52 = 64 + 25  = 89  Work out the difference of the two results: 89 – 9 = 80  The result is two times the product of the original numbers: 2 × 5 × 8 = 80  Prove this result algebraically.    ……………………………………………………………………………………………….............  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………..........................................  ……………………………………………………………………………………………….............  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………..........................................  (*4 marks*)  **Turn over for the next question** |

Do not write  
outside the  
box

**8**

|  |
| --- |
| **20** A bag contains *x* apples, 2*x* oranges and 1 banana.    Two items of fruit are selected at random from the bag without replacement.  The probability of selecting an apple followed by an orange is  How many apples are in the bag?  …………………………………………………………………………..........................................  ……………………………………………………………………………………………….............  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………………………………..........  …………………………………………………………………………..........................................  Answer …………..…………………………..……... (*4 marks*)  Copyright © 2011 AQA and its licensors. All rights reserved.  **END OF QUESTIONS** |

Do not write  
outside the  
box

**4**

**4**