**Welcome Year 7!**

Mr Lutwyche has been extremely busy this summer.

He has visited ten different destinations around the globe.

You must answer the mathematics questions, link your answers to “The Key” and unjumble the letters to find the destination Mr Lutwyche has visited.

The challenge is a chance for you to show off but it doesn’t give you a letter for your final answer.

Good luck!

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **A** | **B** | **C** | **D** | **E** | **F** | **G** |
| $$4$$ | $$2.5$$ | $$12$$ | $$60$$ | $$8$$ | $$-4$$ | $$23$$ |
| **H** | **I** | **J** | **K** | **L** | **M** | **N** |
| $$11$$ | $$9$$ | $$48$$ | $$36$$ | $$20$$ | $$7$$ | $$32$$ |
| **O** | **P** | **Q** | **R** | **S** | **T** | **U** |
| $$180$$ | $$13$$ | $$25$$ | $$10$$ | $$15$$ | $$3$$ | $$5$$ |
|  | **V** | **W** | **X** | **Y** | **Z** |  |
|  | $$18$$ | $$3.5$$ | $$4.5$$ | $$12$$ | $$-3$$ |  |

*Destination 1 – types of number:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Question** | **Answer** | **Letter** |
| Use this set of numbers for the questions below:$$6,8,9,12,13,15,21,27,32$$ |
| **1.** | Which of the numbers are multiples of $5$? |  |  |
| **2.** | Which of the numbers are prime? |  |  |
| **3.** | Which of the numbers are square numbers? |  |  |
| **4.** | Which number is the square root of $16$? |  |  |
| **5.** | Which of the numbers is $2^{5}$? |  |  |
| **Answer:** |  |
| **Challenge:** | Which of the numbers are triangular numbers? |  |

*Destination 2 – perimeter, area, volume:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Question** | **Answer** | **Letter** |
| **1.** | What is the area of a square whose sides are $6cm$ in length? |  |  |
| **2.** | What is the perimeter of a square whose area is $4cm^{2}$? |  |  |
| **3.** | A triangle has a base of $4cm$ and a height of $5cm$. What is its area? |  |  |
| **4.** | What is the length of a side of a cube whose volume is $27cm^{3}$? |  |  |
| **5.** | The area of a triangle is $36cm^{2}$. If the base measures $6cm$, what is the height of the triangle? |  |  |
| **6.** | A rectangle has an area of $12.5cm^{2}$. The length is double the width. What is the length? |  |  |
| **Answer:** |  |
| **Challenge:** | A circle has a diameter of $8cm$. What is the circumference and area of the circle? |  |

*Destination 3 – simplifying algebra:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Question** | **Answer** | **Letter** |
|  | Simplify fully the expressions below: |  |  |
| **1.** | $$x+x+x+x= ?x$$ |  |  |
| **2.** | $$2×5y= ?y$$ |  |  |
| **3.** | $$4a+10a+a= ?a$$ |  |  |
| **4.** | $$2m+8n-m+n=m + ?n$$ |  |  |
| **5.** | $$4\left(x+5\right)=4x + ?$$ |  |  |
| **6.** | $$8\left(4g-5\right)= ?g-40$$ |  |  |
| **7.** | $$7\left(d+2\right)-3\left(d+1\right)= ?d+11$$ |  |  |
| **8.** | $$\left(6t\right)^{2}= ?t^{2}$$ |  |  |
| **Answer:** |  |
| **Challenge:** | Simplify fully $5\left(x-2\right)+3(3-2x)$ |  |

*Destination 4 – average and range:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Question** | **Answer** | **Letter** |
| **1.** | Find the mode of the following set of data:$$5,7,8,4,1,1,8,4,3,4,3,7$$ |  |  |
| **2.** | Find the mean of the following set of data: $14,16,7,2,6,12,6$ |  |  |
| **3.** | Find the median of the following set of data:$$1.3, 2.4, 1.7, 2.6, 3.1, 2.9$$ |  |  |
| **4.** | Find the range of the following set of data:$$7,21,4,18,19,24,23,11$$ |  |  |
| **Answer:** |  |
| **Challenge:** | The mean height of $5$ people is $162cm$. One more person joins and is $180cm$ tall. What is the mean height of the $6$ people? |  |

*Destination 5 – angle properties:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Question** | **Answer** | **Letter** |
| **1.** | The angles $a$ and $b$ below add to what? |  |  |
| **2.** | Calculate the size of angle $c$ in the triangle below: |  |  |
| **3.** | The sum of the interior angles of a shape is $180°$. How many sides does the shape have?  |  |  |
| **4.** | Calculate the size of angle $d$. |  |  |
| **5.** | The sum of the interior angles of a shape is $360°$. How many sides does the shape have?  |  |  |
| **Answer:** |  |
| **Challenge:** | What is the size of an interior angle of a regular pentagon? |  |

*Destination 6 – solving equations:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Question** | **Answer** | **Letter** |
| **1.** | $$3x=24$$ |  |  |
| **2.** | $$\frac{x}{2}=10$$ |  |  |
| **3.** | $$19-x=15$$ |  |  |
| **4.** | $$\frac{x}{3}-5=15$$ |  |  |
| **5.** | $$2x+5=21$$ |  |  |
| **6.** | $$5x-3=17$$ |  |  |
| **7.** | $$\frac{3x}{4}=24$$ |  |  |
| **8.** | $$\frac{x}{2}-5=11$$ |  |  |
| **9.** | $$4x+3=17$$ |  |  |
| **10.** | $$2x+11=5$$ |  |  |
| **Answer:** |  |
| **Challenge 1:** | $$3\left(x-2\right)=21$$ |  |
| **Challenge 2:** | $$5x-2=3x+10$$ |  |

*Destination 7 – time problems:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Question** | **Answer** | **Letter** |
| **1.** | The next bus is at $11.04am$. The time now is $10.54am$. How many minutes must I wait for the next bus? |  |  |
| **2.** | Complete the $24$ hour time $20:34$ in $12$ hour time: $?:34pm$ |  |  |
| **3.** | I have $2 hours 25 minutes$ of recording time left on my TV box. I want to record two programmes that last $1 hour 45 minutes$ and $35 minutes$. How much time will be left on my TV box after recording these programmes? |  |  |
| **4.** | I can do a lap of a cycle track in $1 minute 32 seconds$. How many laps can I complete $20 minutes$? |  |  |
| **Answer:** |  |
| **Challenge:** | I travel $2 hours 45 minutes$ at a speed of $48kph$. How far did I travel? |  |

*Destination 8 – fractions, decimals, percentages:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Question** | **Answer** | **Letter** |
| **1.** | Find $\frac{1}{2}$ of $18$. |  |  |
| **2.** | What is $40\%$ of $20$? |  |  |
| **3.** | Find $\frac{3}{4}$ of $16$. |  |  |
| **4.** | What is the missing number below:$\frac{100}{?}=\frac{5}{9}$ ? |  |  |
| **5.** | What is $\frac{28}{400}$ as a percentage? |  |  |
| **6.** | What is $\frac{3}{5}$ of $7.5$? |  |  |
| **Answer:** |  |
| **Challenge:** | Put the following in ascending order:$$67\%, \frac{2}{3},0.635,\frac{13}{20}$$ |  |

*Destination 9 - probability:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Question** | **Answer** | **Letter** |
| **1.** | There are $12$ counters in a bag. The probability of picking a blue counter from the bag is $\frac{1}{3}$. How many blue counters are in the bag? |  |  |
| **2.** | In a bag of $30$ sweets, $6$ are orange. What is the probability, as a percentage, of choosing an orange sweet? |  |  |
| **3.** | The probability of picking a red card is $0.25$. There are $28$ cards to choose from. How many are red? |  |  |
| **4.** | If I roll a fair, six sided dice $54$ times, how many times would I expect to roll a $6$? |  |  |
| **Answer:** |  |
| **Challenge:** | What is the probability of rolling two fair, six sided dice and scoring a total of 6? |  |

*Destination 10 - sequences:*

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Question** | **Answer** | **Letter** |
| **1.** | What is the next term in the sequence $1,4,7,10…$? |  |  |
| **2.** | What is the term-to-term rule for the sequence $7,11,15,19…$ |  |  |
| **3.** | What is the 4th term of the sequence $3n-2$? |  |  |
| **4.** | What is the next term in the sequence $-1,2,7,14…$? |  |  |
| **5.** | What is the 3rd term of the sequence $7n-1$? |  |  |
| **6.** | What is the next term in the sequence $19,15,11,7…$? |  |  |
| **7.** | The nth term of the sequence $7,12,17,22…$ is $?n+2$. |  |  |
| **8.** | Find the 50th term of $4n-20$. |  |  |
| **Answer:** |  |
| **Challenge:** | Find the nth term of $30,26,22,18…$ |  |