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| --- | --- | --- |
| **Maths Teacher****FON / MCL / PER** | **Tutor Class** |  **Name** [Print clearly] |
|  |
|  NOVEMBER EXAMINATIONS 2015 |
| SUBJECT: Year 7 Mathematics |  |
| **Time allowed: 2 Hours** | **Total Marks: 195** |
| READ THESE INSTRUCTIONS FIRSTAll your answers and working are to be written on the examination paper.**Calculators are permitted.****Show all your working for questions worth more than 1 mark.** Answer **all** questions.The number of marks is given in [ ] at the end of each question or part question.

|  |  |  |
| --- | --- | --- |
| Section | Total | Mark |
| **Semester One** | **60** |  |
| **2D and 3D Geometry** | **25** |  |
| **Measurement** | **15** |  |
| **Percentages** | **15** |  |
| **Probability** | **15** |  |
| **Statistics** | **20** |  |
| **Fractions** | **20** |  |
| **Problem Solving** | **25** |  |
| **TOTAL** | **195** |  |

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**This document consists of 28 printed pages and 0 blank pages**

**Semester One**

1. Write the number 64 528 in words.

………………………………………………………………………………………………………… [1]

1. Write the value of the digit 6 in the number 5607.

…………………………… [1]

1. Write as a simple numeral $3 000 000 + 20 000 + 8000 + 600 + 70 + 8$.

…………………………… [1]

1. Four people share 9 pizzas. How much does each receive?

…………………………… [1]

1. Simplify using correct order of operations rules:

$$60-40÷4-6×5$$

…………………………… [2]

1. List the first four square numbers.

…………………………… [2]

1. Use leading figure estimation, showing your working, to estimate the answer to:

$$736308×2.45$$

…………………………… [2]

1. Write $934012$ in expanded notation.

………………………………………………………………………………………………………… [1]

1. List all the factors of 36.

………………………………………………………………………………………………………… [2]

1. Find the highest common factor of 45 and 60.

…………………………… [2]

1. Find the lowest common multiple of 6 and 15.

…………………………… [2]

1. Complete the factor tree below.

48

 [2]

1. Write the next number in the pattern below.
	1. 15, 11, 7 ……..

…………………………… [1]

* 1. Write the rule, in words, you used to find the answer.

………………………………………………………………………………………………………… [1]

1. Complete the table of values using the rule given.

$ b=3×t+2$

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| $$t$$ | $$1$$ | $$3$$ | $$4$$ | $$7$$ |  |
| $$b$$ |  |  |  |  |  |

[2]

1. Simplify each of the following expressions as far as possible.

|  |  |
| --- | --- |
| 1. $8×p×q$

…………………………… [1] | 1. $3×s+4×t$

…………………………… [1] |
| 1. $2m+3n+4m+5n$

…………………………… [1] | 1. $4×a×2×a×a×a×b$

…………………………… [2] |

1. For the angle shown:

$$S$$

$$T$$

$$R$$

* 1. name the vertex

…………………………… [1]

* 1. name the arms

…………………………… [1]

* 1. name the angle

…………………………… [1]

1. Use a protractor to find the measure of the **reflex** angle in the following diagram.

…………………………… [2]

1. Use a protractor to draw an angle of $145°$ in the space below. *One of the arms is already drawn for you.*

[1]

1. Write down:
	1. the complement of $50°$

…………………………… [1]

* 1. the supplement of $30°$

…………………………… [1]

1. Find the value of each unknown angle. In each case, give a reason (not a calculation) for your answer.

|  |  |
| --- | --- |
| $$x°$$$$70°$$ Angle ………………………… Reason …………………………................……[2] | $$y°$$$$110°$$Angle ………………………… Reason …………………………………………[2] |
| $$40°$$$$z°$$Angle ………………………… Reason …………………………………………[2] | $$a°$$$$30°$$$$100°$$Angle ………………………… Reason …………………………………………[2] |

1. Write in expanded notation the decimal number $63.251$.

………………………………………………………………………………………………………… [1]

1. Arrange in **ascending** order:

$$0.15, 0.152, 0.105$$

………………………………………………………………………………………………………… [1]

1. Perform the following calculations by hand (**without using a calculator**) making your method clear.

|  |  |
| --- | --- |
| 1. $689.5-18.25$

…………………………… [2] | 1. $8.12×2.4$

…………………………… [2] |
| 1. $62.1÷6$

…………………………… [2] | 1. $0.8÷0.2$

…………………………… [2] |

1. Use a directed number to represent each of the following:
	1. an increase of 15 kg

…………………………… [1]

* 1. 250 m below sea level

…………………………… [1]

1. Write down the coordinates of each of the points plotted on the grid below.



A

B

C

D

A =

B =

C =

D =

………………………………………………………………………………………………………… [2]

* 1. On the grid above plot the point $(0, -4).$ Label it with the letter E.

[1]

1. Arrange the following directed numbers in **descending** order.

$$-23, 15, -33, -25$$

………………………………………………………………………………………………………… [1]

**2D and 3D Geometry**

*In this section marks may be deducted for* ***incorrect spelling*** *of maths terms*

1. A plane shape with four straight sides is called a quadrilateral. Write down the names of **three** special types of quadrilaterals.

…………………………………………………………………………………………………………….

…………………………………………………………………………………………………………….

[3]

1. Find the value of $x$ in each of the following questions. Give a reason for each answer (the reason cannot be a calculation).

60°

40°

$x$°

*Angle:* ……………………………

*Reason:* …………………………………………………………

[2]

$ x $cm

*6.5* cm

48°

48°

*Side:* ……………………………

*Reason:* …………………………………………………………

[2]

100°

$x$°

*Angle:* ……………………………

*Reason:* …………………………………………………………

[2]

$x$°

65°

105°

135°

*Angle:* ……………………………

*Reason:* …………………………………………………………

[3]

* 1. Name the following solids.

*Note: this solid has a triangular base*

|  |  |  |
| --- | --- | --- |
|  ABC…………………………… [1] | …………………………… [1] | …………………………… [1] |
| DEF …………………………… [1] | *Note: all of the faces are square* …………………………… [1] |  …………………………… [1] |

* 1. Which of the solids above are prisms?

……………………………………………………………………………………………………… [2]

* 1. Which of the solids above are pyramids?

……………………………………………………………………………………………………… [1]

1. Draw the net of the following solid on the grid paper below.

|  |  |
| --- | --- |
|   |  [2] |

1. The given diagram shows different views of the same shape. Draw the 3-dimensional object on the isometric grid paper.

 

top

left

right

front

back

[2]

**Measurement**

***Marks may be lost for missing or incorrect units shown in your answers***

1. Complete the conversions in the table below.

|  |  |  |
| --- | --- | --- |
| **a** 80 cm = ………. mm | **b** 6 km = ………. m | **c** 9 L = ……… mL |
| **d** 15 mL = ……… cm3 | **e**  5000 cm3 = ……… L | [5] |

1. Calculate the perimeter of the figure below.

15.4 cm

12.8 cm

4.6 cm

…………………………… [1]

1. Calculate the area of the following shapes.

5 cm

9 cm

…………………………… [1]

3 cm

5 cm

6 cm

2 cm

*Note: this shape is made up of rectangles*

…………………………… [2]

60 mm

80 mm

…………………………… [2]

*Note: this shape is a parallelogram*

8 m

7 m

…………………………… [2]

1. Find the volume of the solid below.

20 m

15 m

9 m

…………………………… [2]

**Percentages**

1. Complete the table below. Write fractions in their **simplest form**.

|  |  |  |
| --- | --- | --- |
| Percentage | Fraction | Decimal |
| 34% |  …………… | …………… |
| …………… | …………… | 0.88 |
| …………… | $$\frac{9}{200}$$ | …………… |

[6]

1. Find 24% of $900.

…………………………… [2]

1. Write as a percentage 32 min of 1 hour. Round your answer to the nearest whole number.

…………………………… [2]

1. An airline offers a special 30% off normal prices during its off peak time flights to Melbourne. If its normal price is $800 return, what is the special price?

…………………………… [2]

1. In a small country town of 280 households 45% mainly used a wood burning fire to warm their home, 30% used electricity, 15% gas and the rest mainly used oil or kerosene. How many households mainly used gas, oil or kerosene?

…………………………… [3]

**Probability**

1. Order the following events **A**, **B** and **C** from least likely to most likely.

**A** A dice is rolled. The result will be either a 2, a 4 or a 6.

**B** A student chosen at random from your tutor class will have a birthday in December.

**C** Your birthday next year will fall on a week day.

………………………………………………………………………………………………………… [2]

* 1. List all the possible outcomes when a coin is tossed **and** the spinner shown below is spun.

1

2

3

4

 

………………………………………………………………………………………………………

………………………………………………………………………………………………………

[3]

* 1. Use your list to calculate the probability that:
		1. a head and a 3 results

…………………………… [1]

* + 1. a tail and a 1 or 2 results

…………………………… [1]

* + 1. a prime number appears in the outcome

…………………………… [1]

* + 1. a head and a number greater than 1 results.

…………………………… [1]

1. A hat contains 4 red, 3 white and 2 grey discs and one disc is randomly selected from it. Find the probability that it is:
	1. white

…………………………… [1]

* 1. not red

…………………………… [1]

* 1. pink

…………………………… [1]

1. Starting with 64 life chances, work out Mac’s percentage change of survival for the following tracks. At each fork in the track, the life chances must be shared equally among the new tracks. Round your answer to 1 decimal place.

Water

Water

Mac

Mac has a ………………. % chance of survival. [3]

**Statistics**

1. What is the meaning of the word *random* when used within a statistics context?

………………………………………………………………………………………………………….

………………………………………………………………………………………………………….

[1]

1. What is the difference between a *survey* and a *census*?

………………………………………………………………………………………………………….

………………………………………………………………………………………………………….

[2]

1. Explain why a survey of **only** the Year 9 students at ACG Parnell College about changes to the school uniform may result in a biased set of results.

………………………………………………………………………………………………………….

………………………………………………………………………………………………………….

[2]

1. A sample of students were asked to say how many brothers and sisters they had. Here are the results:

2, 1, 4, 5, 2, 3, 1, 6, 3, 4, 2, 3, 2, 3, 4, 3, 3, 2, 1, 1, 3, 1, 6, 4, 2, 1, 1, 3, 2, 7, 0

* 1. Complete the frequency distribution table below for this data.

|  |  |  |  |
| --- | --- | --- | --- |
| Number of brothers and sisters | Tally | Frequency |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

[3]

* 1. Write down the mode.

…………………………… [1]

1. The following results show the distance (to the nearest metre) that students in 7MPF were able to throw a stuffed toy.

12, 24, 15, 9, 18, 34, 42, 26, 37, 14, 18, 22, 26, 41, 7, 12, 18, 15, 25, 30

* 1. Illustrate the data above in an **ordered** stem-and-leaf plot.

[3]

* 1. Find the median.

median = …………………………… [2]

* 1. Calculate the mean. *Round your answer to the nearest whole number.*

mean = …………………………… [2]

1. A survey of eye colour in a class of 30 students revealed the following results:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Eye Colour | Blue | Brown | Green | Grey |  |
| Frequency | 2 | 12 | 9 | 7 |  |

Illustrate these results on a pie chart.

Show your method for working out your angles in the space below.

Method:

**Eye Colour**

[4]

**Fractions**

1. Simplify (work out) each of the following. Show your method clearly. *Leave your answer as a mixed number in its simplest form where appropriate.*

|  |  |
| --- | --- |
| * 1. $\frac{2}{5}+\frac{3}{4}$

 …………………………… [2] | * 1. $5\frac{9}{10}-2\frac{3}{5}$

…………………………… [3] |

1. Simplify each of the following. Show your method clearly.

|  |  |
| --- | --- |
| * 1. $1\frac{3}{4}×\frac{8}{15}$

 …………………………… [3] | * 1. $\frac{5}{8}÷\frac{3}{7}$

…………………………… [3] |
| * 1. $6\frac{3}{5}÷4\frac{1}{10}$
 | …………………………… [3] |

1. A disaster relief team consists of engineers and doctors in the ratio 2 : 5. If there were 18 engineers, find the number of doctors.

…………………………… [3]

1. A bag of 20 marbles is divided between Jill and John in the ratio 2:3.
	1. what **fraction** does Jill receive?

…………………………… [1]

* 1. how many marbles does John receive?

…………………………… [2]

**Problem Solving**

1. What is the largest prime number that divides exactly into the number equal to $2+3+5×7$?

…………………………… [2]

1. In the diagram below, what is the value of $x$?

$$100° $$

$$x° $$

$$324° $$

…………………………… [2]

1. If ▲+ ▲ = ■ and ■ + ▲ = ● and ⬧ = ● + ■ +▲, how many ▲’s are equal to ⬧?

…………………………… [2]

1. At Spuds-R-Us, a 2.5 kg bag of potatoes costs $1.25. How much would one tonne of potatoes cost?

…………………………… [3]

1. The diagram shows a single floor tile in which the outer square has side 8 cm and the inner square has side 6 cm. If Adam Ant walks once around the perimeter of the inner square and Annabel Ant walks once around the perimeter of the outer square, how much further does Annabel walk than Adam?

…………………………… [3]

1. King Harry’s arm is twice as long as his forearm, which is twice as long as his hand, which is twice as long as his middle finger, which is twice as long as his thumb. His new bed is as long as four arms. How many thumbs length is that?

 

forearm

…………………………… [3]

1. In this *Multiplication Magic Square*, the **product** of the three numbers in each row, each column and each of the diagonals is $1$. What is the value of $r+s$?

|  |  |  |  |
| --- | --- | --- | --- |
| $$p$$ | $$q$$ | $$r$$ |  |
| $$s$$ | $$1$$ | $$t$$ |  |
| $$u$$ | $$4$$ | $$\frac{1}{8}$$ |  |

…………………………… [3]

1. A newspaper headline read ‘Hamilton tortoise recaptured 1.8 km from home after 8 months on the run’. Assuming the tortoise travelled in a straight line and that each month has 30 days, roughly how many minutes did the tortoise take on average to ‘run’ one metre?

…………………………… [3]

1. Gill is now 27 and has moved into a new flat. She has four pictures to hang in a horizontal row on a wall which is 4800 mm wide. The pictures are identical in size and are 420 mm wide. Gill hangs the first two pictures so that one is on the extreme left of the wall and one is on the extreme right of the wall. She wants to hang the remaining two pictures so that all four pictures are equally spaced.

How far should Gill place the centre of each of the two remaining pictures from a vertical line down the centre of the wall?

…………………………… [4]

**THE END**