REIGATE GRAMMAR SCHOOL

NOVEMBER 2010

MATHEMATICS
CALCULATOR PAPER

Time allowed: 45 minutes

NAME……………………………………………………………

- **Work through the paper carefully**
- **Do not spend too much time on any single question**
- **Show any working in the spaces provided**
- **Use the blank left hand pages for rough work**
- **Remember to show all of your working, even if you are using your calculator**

Given that $s = (t - \dfrac{1}{2}u)^3$, **find**

    (i) s **when** $t = 9$ **and** $u = 12$

          ....

3

    (ii) u **when** $s = 1000$ **and** $t = 8$

          ....

4

Solve the equations

    $3x = 7x - (10 - x)$

          ....

3

$\dfrac{x}{2} - \dfrac{x}{5} = 6$

          ....

3

$\dfrac{3x}{5} = \dfrac{2}{3}$

          ....
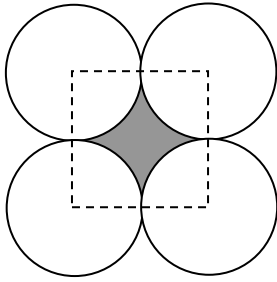
3

$\dfrac{3}{x} = 12$

          ....

2

4 circles of radius 8cm are drawn so that they touch each other as shown creating the shaded region. Find the area of the shaded region.

………………………….. | **4**

The cost of 2 kittens and 1 puppies is £106. This information can be written as

2k + p = 106

The cost of 1 kitten and 2 puppies is £119. Write down an equation to represent this information.

…………………………..

Find the cost of each kitten and each puppy | **2**

Kitten =…………………………..

Puppy = ………………………….. | **3**

Look at the pattern below

		TOTAL	
Row 1	29 × 31	= 899	= 30 × 30 -- 1 × 1
Row 2	28 × 32	= 896	= 30 × 30 -- 2 × 2
Row 3	27 × 33	= 891	= 30 × 30 -- 3 × 3
Row 4	26 × 34	= 884	= 30 × 30 -- 4 × 4

On the dotted line below complete Row 5

Row 5……………………………………………………………………………………………   **2**

Which row will have a total of 836?

…………………………   **2**

What is the total of row 20?

…………………………   **2**

Now look at this second pattern

TEAMS	2	3	4	5
MATCHES	A vs B	A vs B	A vs B	A vs B
		A vs C	A vs C	A vs C
		B vs C	A vs D	A vs D
			B vs C	A vs E
			B vs D	B vs C
			C vs D	B vs D
				B vs E
				C vs D
				C vs E
				D vs E
TOTAL	1	3	6	10

Each total is obtained by counting the number of matches in a league.

What is the TOTAL number of league matches for 7 TEAMS?

…………………………   **2**

What number of TEAMS would there be in a league with a TOTAL of 91 matches?

…………………………   **2**

A pick'n'mix bag contains 10 swizzles, 7 toffees and 8 gob-stoppers. I select a sweet from the bag.

(a) What is the probability that my sweet is not a swizzle?   …………   **1**

(b) What is the probability that my sweet is a chocolate peanut?   …………   **1**

I eat the first sweet. I now select a second sweet.

(c) If my first sweet was a toffee what is the probability that my second sweet is another toffee?

……………   **2**

(d) If my first sweet was a toffee what is the probability that my second sweet is a gob-stopper?

……………   **2**

The value of a gold ingot at the end of every year is 10% more than it was at the start of the year. In January 2009 a gold ingot was worth £8000.

(i)   How much was it worth in January 2010?

……………………   **2**

(ii)   How much will it be worth in January 2015?

……………………   **3**

At the start of which year will the value of the ingot first be more than £20000?

……………………   **3**

END OF EXAMINATION
IF YOU HAVE TIME CHECK YOUR WORK

13+ Entrance Examination

NOVEMBER 2010

MATHEMATICS
NON CALCULATOR PAPER

Time allowed: 20 minutes

NAME……………………………………………………………

- Work through the paper carefully
- Do not spend too much time on any single question
- Show any working in the spaces provided
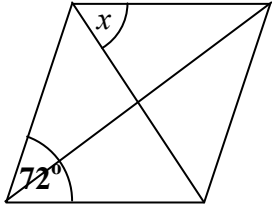- Use the blank left hand pages for rough work

Page 1

Complete each of the following, showing your working in the space provided

			Do not write in this box
2011 + 999 =	2011 – 999 =	2011 × 11 =	1 1 1
Use your previous answer to find 20.11 × 1.1 =	What is 24 × 9?	Use your previous answer to write down the answer to 2400 × 90	1 1 1
20.11 + 0.09 =	20.11 + 0.9 =	20.11 + 9 =	1 1 1
Given that 25 × 19 = 475 Use this answer to find 475 ÷ 19 = and 47500 ÷ 19 = and (475 + 475) ÷ 19 =	Given that 567 ÷ 27 = 21 Use this answer to find 567 ÷ 21 = and 56.7 ÷ 2.7 =	What is 4000 ÷ 40 ………………… Use your answer to write down the answers to 4000 ÷ 20 ………………… 4000 ÷ 80 ……………………	1 1 1 1 1 1 1 1

			Do not write in this box
Write these three quantities in order of size, starting with the <u>smallest</u> first. $\dfrac{5}{6}$, 0.8, 9% ……………………………..	What is $7\dfrac{1}{2}$ % of £400	Find five eighths of 408p ……………………………..	2 2 2
Solve these equations $3x - 4 = 2(13 - x)$ …………………………….. $\dfrac{x+5}{4} = \dfrac{1}{2}$ ……………………………..	$\dfrac{14}{15} \times \dfrac{5}{7} + \dfrac{1}{2}$ …………………………….. $\left(\dfrac{4}{5} - \dfrac{2}{3}\right) \div 2\dfrac{1}{2}$ ……………………………..	Write down a <u>fraction</u> between 0.16 and 0.17 --------- Write down a <u>decimal</u> between $\dfrac{1}{3}$ and 30% ---------	3 3 3 3 1 1
Find the next 2 terms in the sequence: 2, 5, 7, 12, 19, 31, … …… …….	What is ⅜ as: A decimal? …………………………….. A percentage? ……………………………..	A father share out £35 pocket money in the ratio of 3:5:6. How much does each child get? -------, -------, -------	2 1 1 4
Drawn below is a rhombus and its diagonals. Find the value of *x*. …………………			3

REIGATE GRAMMAR SCHOOL

13+ Entrance Examination
November 2011

MATHEMATICS

Time allowed: 45 minutes

NAME...

- **Work through the paper carefully**
- ## You do not have to finish everything
- **Do not spend too much time on any single question**
- **Show any working in the spaces provided**
- **Use the blank left hand pages for rough work**

Given that $s = (t - \frac{1}{2}u)^3$, **find**

    (iii) s when $t = 9$ and $u = 12$

....   **3**

    (iv) u when $s = 1000$ and $t = 8$

....   **4**

Solve the equations

    $3x = 7x - (10 - x)$

....   **3**

$\dfrac{x}{2} - \dfrac{x}{5} = 6$

....   **3**

$\dfrac{3x}{5} = \dfrac{2}{3}$

....   **3**

$\dfrac{3}{x} = 12$

....   **2**
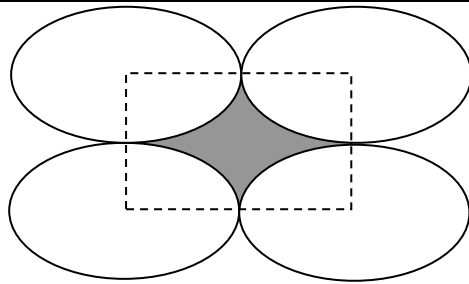
You are given that the area of an ellipse is π×r×s, where r is the length of the short radius and s is the length of the long radius. 4 ellipses of short radius 8cm and long radius 10cm are drawn so that they touch each other as shown creating the shaded region. Find the area of the shaded region.

4

…………………………..

The cost of 3 hens and 1 duck is £23. This information can be written as

3h + d = 23

The cost of 1 hen and 3 ducks is £29. Write down an equation to represent this information.

…………………………..

2

Assuming all hens are the same price and all ducks are the same price, find the cost of each hen and each duck.

Hen =…………………………..

Duck = …………………………..

3

Look at the pattern below

		TOTAL	
Row 0	12 × 12	= 144	= 12 × 12 -- 0 × 0
Row 1	11 × 13	= 143	= 12 × 12 -- 1 × 1
Row 2	10 × 14	= 140	= 12 × 12 -- 2 × 2
Row 3	9 × 15	= 135	= 12 × 12 -- 3 × 3

On the dotted line below complete Row 4

Row 4………………………………………………………………………………………   **2**

Which row will have a total of 95?

....   **2**

What is the total of row 13?

....   **2**

Now look at this second pattern

TEAMS	2	3	4	5
MATCHES	A vs B	A vs B	A vs B	A vs B
		A vs C	A vs C	A vs C
		B vs C	A vs D	A vs D
			B vs C	A vs E
			B vs D	B vs C
			C vs D	B vs D
				B vs E
				C vs D
				C vs E
				D vs E
TOTAL	1	3	6	10

Each total is obtained by counting the number of matches in a league.

What is the TOTAL number of league matches for 8 TEAMS?

....   **2**

What number of TEAMS would there be in a league with a TOTAL of 104 matches?

....   **2**

A bag of mini-cheeses contains 16 Cheddars, 13 Stiltons and 7 Red Leicesters. I select a mini-cheese from the bag.

    (e) **What is the probability that my cheese is not a Cheddar?**   ………… **1**

    (f) **What is the probability that my cheese is a Camembert?**   ………… **1**

I eat the first cheese. I now select a second cheese.

    (g) **If my first cheese was a Cheddar what is the probability that my second sweet is another Cheddar?**   **2**

                        ……………

    (h) **If my first cheese was a Stilton what is the probability that my second sweet is a Red Leicester?**

                        …………… **2**

It is estimated that the population of tigers goes down by 10% every year. In January 2010 there were an estimated 2000 tigers.

    (iii)   **How many tigers were there in January 2011?**

                        ………………………… **2**

    (iv)   **How many tigers will their be in January 2025 (nearest whole number)?**

                        ………………………… **3**

At the start of which year will the population first be below 800?

                        ……………………… **3**

END OF EXAMINATION
IF YOU HAVE TIME CHECK YOUR WORK

REIGATE GRAMMAR SCHOOL

13+ Entrance Examination November 2011

MATHEMATICS

Time allowed: 20 minutes

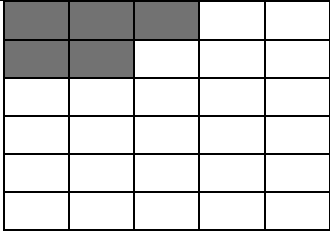NAME..

- Work through the paper carefully

- ## You do not have to finish everything
- Do not spend too much time on any single question
- Show any working in the spaces provided
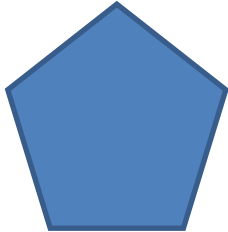- Use the blank left hand pages for rough work

PAGE	1	2	3	TOTAL
MARK	18	24	18	60
MARK				

PAGE 1
ANSWER ALL QUESTIONS IN THE SPACES PROVIDED, SHOWING ANY NECESSARY WORKINGS

|			DO NOT WRITE IN THIS BOX
2002 + 999 =	2002 – 999 =	What is 2002 x 10?	1 1 1
Use your previous answer to write down 2002 x 5	Use these last two answers to write down 2002 x 15	Use your previous answer to write down 20.02 x 1.5	1 1 1
2002 - 7 =	2002 - 70 =	2002 - 700 =	1 1 1
Given that 35 x 17 = 595 What is 595 ÷ 17 ? What is 59500 ÷ 17? What is (595 + 595 + 595) ÷ 17?	What is 600 x 12 ? What is 600 x 1.2? What is 600 x 0.12?	What is 8000 ÷ 100? What is 8000 ÷ 400? What is 8000 ÷ 50?	1 1 1 1 1 1 1 1 1

PAGE 1

			DO NOT WRITE IN THIS BOX
Which of these three is the largest and which is the smallest? 70% 0.65 $\frac{4}{5}$ Largest = Smallest =	**What is 10% of £600?** **What is 5% of £600?** **What is $2^1/_2$% of £600?** **Use your answers to find $17^1/_2$% of £600**	**Find one ninth of 360** **Use your answer to find four ninths of 360**	1 1 1 1 1 1 1 1
Add together $\frac{1}{4}$ of 24 $\frac{2}{5}$ of 30 and $\frac{1}{2}$ of 15	**Richard is 12 years old.** **Adam is twice as old as Richard.** **Will is $\frac{2}{3}$ of Adam's age.** **What is their total age?**	**Write down a decimal between 75% and 80%** **Write down a fraction between 60% and 70%**	1 1 1 1 1 1 1 1 1
What are the next two numbers in these series 1, 4, 8, 13, 19,…….. and 1, 1, 2, 3, 5, 8,….. and	**Put these decimals in order, starting with the largest.** 0.101, 0.011, 0.11	 **What fraction of this flag is shaded?** **How many more rectangles need to be shaded to fill $\frac{2}{3}$ of the flag?**	2 2 1 1 1

Work out $\dfrac{1}{3} + \dfrac{5}{12}$	Work out $\dfrac{7}{15} - \dfrac{2}{5}$	Add together the following, giving your answer as a DECIMAL 65%, 0.507 and $\dfrac{1}{4}$	DO NOT WRITE IN THIS BOX 1 1 1 1 1 1 1
What is the biggest number that divides exactly into 60, 72 and 84?	What is the smallest number that 2, 3, and 8 all divide into?	Find two numbers that have a difference of 5 and add up to 19	1 1 1
What is 0.7 written as a fraction? What is 0.07 written as a fraction? What is 0.707 written as a fraction?	What is $\dfrac{1}{5}$ written as a decimal? What is $\dfrac{1}{50}$ written as a decimal? What is $\dfrac{3}{50}$ written as a decimal?	Name the shapes below 	1 1 1 1 1 1 1 1
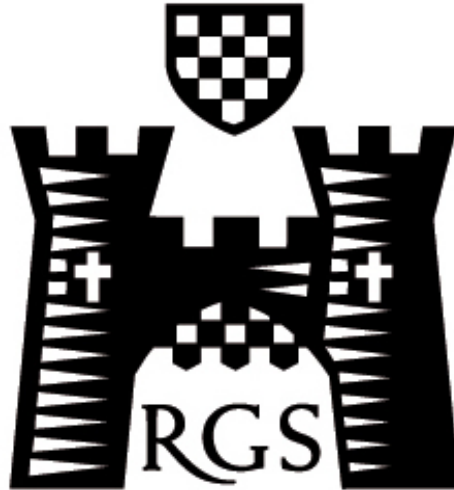
PAGE 3

Reigate Grammar School

13+ Entrance Examination
November 2012

MATHEMATICS

Time allowed: 45 minutes

NAME…………………………………………………………………………

- Work through the paper carefully
- **You do not have to finish everything**
- Do not spend too much time on any single question
- Show any working in the spaces provided
- Use the blank left hand pages for rough work

Given that $s = \sqrt{t^3 + u}$**, find**

    (v) s when $t = 3$ and $u = 22$

                      3

    (vi) u when $s = 11$ and $t = 5$

                      4

Solve the equations

    $5x = 7x - (12 - x)$

                      3

$$\frac{x}{4} - \frac{x}{6} = 5$$

                      3

$$\frac{4x}{7} = \frac{3}{4}$$

                      3
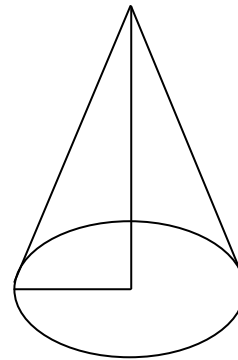
$$\frac{4}{x} = 20$$

                      2

You are given that the volume of a cone is equal to the area of the circular base multiplied by one third of its height.
Given that the base radius is 6cm and the height is 14cm, find the volume of the cone shown here.

4

…………………………..

The cost of 4 antelopes and 1 gazelle is £680. This information can be written as

$$4a + g = 680$$

The cost of 2 antelopes and 3 gazelles is £540. Write down an equation to represent this information.

…………………………..

2

Assuming all antelopes are the same price and all gazelles are the same price, find the cost of each antelope and each gazelle.

Antelope =…………………………..

Gazelle = …………………………..

3

Look at the pattern below

		TOTAL	
Row 0	25×25	$= 625$	$= 25 \times 25 - 0 \times 0$
Row 1	24×26	$= 624$	$= 25 \times 25 - 1 \times 1$
Row 2	23×27	$= 621$	$= 25 \times 25 - 2 \times 2$
Row 3	22×28	$= 616$	$= 25 \times 25 - 3 \times 3$

On the dotted line below complete Row 4

Row 4………………………………………………………………………………   2

Which row will have a total of 576?

....   2

What is the total of row 12?

....   2

A second pattern shows teams in two leagues, where each team in league A plays each team in league B

TEAMS	2	4	6
MATCHES	A1 vs B1	A1 vs B1	A1 vs B1
		A1 vs B2	A1 vs B2
		A2 vs B1	A1 vs B3
		A2 vs B2	A2 vs B1
			A2 vs B2
			A2 vs B3
			A3 vs B1
			A3 vs B2
			A3 vs B3
TOTAL	1	4	9

Each total is obtained by counting the number of matches.

What is the TOTAL number of league matches for 8 TEAMS?

....   2

What number of TEAMS would there be in a league with a TOTAL of 400 matches?

....   2

A bag of pick-n-mix contains 12 Caramels, 5 Nougats and 8 Pralines. I select a sweet at random from the bag.

   (i) What is the probability that my sweet is not a Nougat?   …………   **1**

   (j) What is the probability that my sweet is a Liquorice?   …………   **1**

I eat the first sweet. I now select a second sweet.

   (k) If my first sweet was a Nougat, what is the probability that my second sweet is another Nougat?   **2**

                                ……………

   (l) If my first sweet was a Praline what is the probability that my second sweet is a Caramel?

                                ……………   **2**

It is estimated that the population of the UK goes up by 1% every year. According to the January 2011 census, there were 61,000,000 people living in the UK.
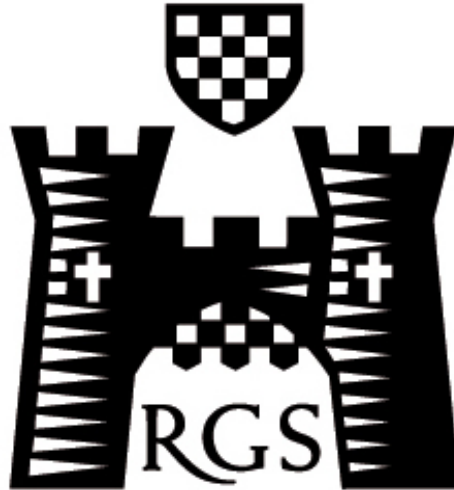
   (v)   What was the UK population in January 2012?

                                ……………………   **2**

   (vi)   In the next census, 2021, what is the expected UK population (nearest whole number)?

                                ……………………   **3**

At the start of which year will the population first be greater than 70 million?

                                ……………………   **3**

END OF EXAMINATION
IF YOU HAVE TIME CHECK YOUR WORK

Reigate Grammar School

13+ Entrance Examination
November 2012

MATHEMATICS

Time allowed: 20 minutes

NAME……………………………………………………………………

- Work through the paper carefully
- **You do not have to finish everything**
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- Show any working in the spaces provided
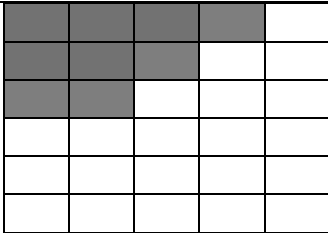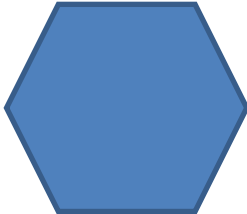- Use the blank left hand pages for rough work

PAGE	1	2	3	TOTAL
MARK	18	24	18	60
MARK				

PAGE 1
ANSWER ALL QUESTIONS IN THE SPACES PROVIDED, SHOWING ANY NECESSARY WORKINGS

			DO NOT WRITE IN THIS BOX
2012 + 499 =	2012 – 499 =	What is 2012 x 100?	1 1 1
Use your previous answer to write down 2012 x 50	Use these last two answers to write down 2012 x 150	Use your previous answer to write down 20.12 x 1.5	1 1 1
2012 - 9 =	2012 - 90 =	2012 - 900 =	1 1 1
Given that 31 x 16 = 496 What is 496 ÷ 16 ? What is 49600 ÷ 16? What is (496+496) ÷ 8?	What is 700 x 15 ? What is 700 x 1.5? What is 700 x 0.015?	What is 600 ÷ 1000? What is 600 ÷ 2000? What is 600 ÷ 250?	1 1 1 1 1 1 1 1 1

			DO NOT WRITE IN THIS BOX
Which of these three is the largest and which is the smallest? 8% 0.1 $\frac{1}{11}$ Largest = Smallest =	**What is 10% of £4000?** **What is 5% of £4000?** **What is $2\frac{1}{2}$% of £4000?** **Use your answers to find $27\frac{1}{2}$% of £4000**	**Find one seventh of 560** **Use your answer to find five sevenths of 560**	1 1 1 1 1 1 1 1
Add together $\frac{1}{5}$ of 20 $\frac{2}{3}$ of 33 and $\frac{1}{2}$ of 9	**Richard is 15 years old.** **Adam is four times as old as Richard.** **Will is $\frac{5}{6}$ of Adam's age.** **What is their total age?**	**Write down a decimal between 95% and 96%** **Write down a fraction between 20% and 25%**	1 1 1 1 1 1 1 1 1
What are the next two numbers in these series 3, 12, 48, 192, …….. and 1, 3, 4, 7, 11, 18,….. and	**Put these decimals in order, starting with the largest.** 0.072, 0.69, 0.7	 **What fraction of this flag is shaded?** **How many more rectangles need to be shaded to fill $\frac{2}{3}$ of the flag?**	2 2 1 1 1

Work out $\frac{1}{5} + \frac{4}{15}$	Work out $\frac{11}{12} - \frac{2}{3}$	Add together the following, giving your answer as a DECIMAL 46%, 0.258 and $\frac{3}{5}$	DO NOT WRITE IN THIS BOX 1 1 1 1 1 1 1
What is the biggest number that divides exactly into 30, 42 and 54?	What is the smallest number that 4, 5, and 6 all divide into?	Find two numbers that have a difference of 11 and add up to 23	1 1 1
What is 0.13 written as a fraction? What is 0.0013 written as a fraction? What is 0.1313 written as a fraction?	What is $\frac{1}{4}$ written as a decimal? What is $\frac{1}{400}$ written as a decimal? What is $\frac{7}{400}$ written as a decimal?	Name the shapes below	1 1 1 1 1 1 1 1