

Reigate Grammar School



13+ Entrance Examination November 2015

MATHEMATICS

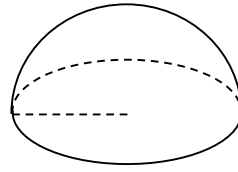
Time allowed: 45 minutes

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
- You may use a calculator, but must show sufficient working

<p>Given that $f = \sqrt{g^3 + 3h}$, find</p> <p>(i) f when $g = 3$ and $h = 3$</p> <p>.....</p> <p>(ii) g when $f = 10$ and $h = 12$</p> <p>.....</p>	<p>Do not write in this box</p> <p>3</p> <p>4</p>
<p>Solve the equations</p> <p>$2x = 4x - (6 - x)$</p> <p>.....</p> <p>$\frac{3x}{4} - \frac{2x}{3} = 5$</p> <p>.....</p> <p>$\frac{2x}{3} = \frac{5}{7}$</p> <p>.....</p> <p>$\frac{12}{x} = 27$</p> <p>.....</p>	<p>3</p> <p>3</p> <p>3</p> <p>2</p>

You are given that the volume of a sphere is equal to the $\frac{4}{3}$ multiplied by the radius multiplied by the area of the circle at the equator. Given that the radius of the base is 12cm, find the volume of the hemisphere.



Do not
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in this
box

4

.....

The cost of 2 gold medals and 1 silver medal is £250. This information can be written as

$$2g + s = 250$$

The cost of 1 gold medals and 3 silver medal is £300. Write down an equation to represent this information.

.....

Assuming all gold medals are the same price and all silver medals are the same price, find the cost of each medal.

2

3

1 Gold Medal = £.....

1 Silver Medal = £.....

Look at the pattern below				Do not write in this box
Row 1	1	TOTAL = 1	= (1) ²	
Row 2	1 + 8	= 9	= (1 + 2) ²	
Row 3	1 + 8 + 27	= 36	= (1 + 2 + 3) ²	
Row 4	1 + 8 + 27 + 64	= 100	= (1 + 2 + 3 + 4) ²	
On the dotted line below complete Row 5				
Row 5.....				2
What is the total of row 8?				
.....				2
Which row will have a total of 784?				
.....				2
A second pattern shows teams in a league, where each is assigned a number, and each odd-numbered team plays all the even-numbered teams, home and away.				
TEAMS	2	4	6	
MATCHES	1 vs 2 2 vs 1	1 vs 2 1 vs 4 3 vs 2 3 vs 4 2 vs 1 4 vs 1 2 vs 3 4 vs 3	1 vs 2 1 vs 4 1 vs 6 3 vs 2 3 vs 4 3 vs 6 5 vs 2 5 vs 4 5 vs 6	2 vs 1 4 vs 1 6 vs 1 2 vs 3 4 vs 3 6 vs 3 2 vs 5 4 vs 5 6 vs 5
TOTAL	2	8	18	
Each total is obtained by counting the number of matches.				
What is the TOTAL number of league matches for 10 TEAMS?				
.....				2
What number of TEAMS would there be in a league with a TOTAL of 128 matches?				
.....				2

<p>Give fractions in their lowest terms: A shipment of flowers contains 6 Crocuses, 8 Daffodils and 10 Peonies. I select a flower at random from the shipment.</p> <p>(a) What is the probability that my flower is a Daffodil?</p> <p>(b) What is the probability that my flower is not a Crocus?</p> <p>I give away the two flowers. I now select a third flower.</p> <p>(c) If my first two flowers were both Crocuses, what is the probability that my third flower is another Crocus? </p> <p>(d) If my first two flowers were Daffodils what is the probability that my third flower is a Peony? </p>	<p>Do not write in this box</p> <p>1</p> <p>1</p> <p>2</p> <p>2</p>
<p>It is estimated that the population of Iceland goes up by 2% every year. In January 2015, the population of Iceland was 329,100.</p> <p>(i) What is the expected population of Iceland in January 2016? </p> <p>(ii) What is the expected population of Iceland in January 2020 (nearest whole number)? </p> <p>(iii) What is the expected population of Uruguay in January 2050 (nearest whole number)? </p> <p>END OF EXAMINATION IF YOU HAVE TIME, CHECK YOUR WORK</p>	<p>2</p> <p>3</p> <p>3</p>