# The Haberdashers' Aske's Boys' School
# Elstree

# 11+ Entrance Examination 2007

## MATHEMATICS
### One Hour

*Full Name* ....................................................................................................

*Examination Number* ..............................

## INSTRUCTIONS

1.  DO NOT OPEN THIS PAPER UNTIL YOU ARE TOLD TO DO SO.

2.  There are 30 questions on this paper. DO NOT FORGET TO TURN OVER.

3.  Work quickly but accurately. You are recommended to use pencil, but you can use pen or biro if you wish.

WRITE YOUR ANSWERS TO THE QUESTIONS IN THE SPACES PROVIDED.
YOU MAY USE THE SPACE AT THE BOTTOM OF EACH PAGE FOR WORKING.

Answer

1.  Add                    $49 + 37$                                                       _____

2.  Subtract               $85 - 28$                                                      _____

3.  Multiply               $58 \times 6$                                                  _____

4.  Divide                 $9027 \div 9$                                                  _____

5.  A school fair needs to attract 350 people in order to make a profit.  There are
    already 143 tickets sold.  How many more tickets need to be sold?                     _____

6.  Peter Piper picked 716 pecks of pickled pepper and each peck of pickled
    pepper had 4 pips.  How many pips of pickled pepper did Peter Piper pick?             _____

7.  A large crate contains 60 cartons of milk.  If one layer consists of 12 cartons,
    how many layers are there?                                                            _____

8.  A number is missing from this sequence.  What is it?

                            3, 5, __ , 15, 23, 33                                          _____

9.  Which of the following numbers is closest to 1?

                    $1.01, \quad 99\%, \quad \dfrac{9}{10}, \quad \dfrac{999}{1000}, \quad 0.99$        _____

10. In the number 5345, the difference in value between the 3 and the 4 is
    $300 - 40 = 260$.  What is the difference <u>in value</u> between the two fives?      _____

11. Give the size of the obtuse angle between the compass directions NE and S.            _____

12. There are 10 lamp posts in my street.  The distance between each lamp post
    is 30 metres.  What is the distance between the first post and the tenth post?
    (Ignore the width of the posts)                                                       _____

13. What is the approximate value of   $\dfrac{496}{997} \times 14.04$ ?  Give your answer to the

    nearest whole number.                                                                 _____


SPACE FOR WORKING

14. A bookshelf can hold 18 books of width 8 cm. How many books of width 6 cm can it hold?                    _____

15.  Two-thirds of a fence has been painted.  If there are still 15 metres left to paint, how long is the fence?                    _____

16.   The perimeter of a rectangle is 28 cm.  If the length of the rectangle is 10 cm more than the width, find the width and the length of the rectangle.

Width    _____
Length    _____

17. Are the following statements sensible? Write 'Yes' or 'No'

A lorry weighs 2000 g.                    _____
A fifteen year old girl weighs 50 kg.                    _____
Blackpool Tower is 200 cm high.                    _____
A horse is 15 m high.                    _____

18.  In Dimple mania, there is a strange currency system, in which

12 coppers equal 1 silver
and      10 silvers equal 1 gold

Gretel pays for a drink which costs 6 silvers and 8 coppers with 1 gold.
How much change should she receive in silvers and coppers?

Silvers    _____

Coppers    _____

19.  My sons support Liverpool Football Club.  One season they played 38 games.  They lost 2 of these games and won twice as many as they drew.  How many games did they win?                    _____

A win scores 3 points, a draw scores 1 point and a loss scores nothing.
How many points did they score in the season?                    _____

SPACE FOR WORKING

20. My son is also mad about Formula 1 Racing.  In Formula 1, a driver
    scores points  as follows:

| Position | $1^{st}$ | $2^{nd}$ | $3^{rd}$ | $4^{th}$ | $5^{th}$ | $6^{th}$ | $7^{th}$ | $8^{th}$ |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|
| Points   | 10  | 8   | 6   | 5   | 4   | 3   | 2   | 1   |

In one season, Kimi Raikkonen, (his favourite driver ) won 8 races,
finished second 3 times, third 3 times, fifth twice and seventh once.
He retired from 3 of the races.
How many races were there in this F1 season?                         _____

How many points did Kimi score?                                      _____

What was the average number of points per race?                      _____

If  Kimi did not score the most points in that season, what is the
maximum number of points that the winning driver could have scored?  _____

21.        Input   ── ⟨ ×5 ⟩ ────────── ⟨ +3 ⟩ ──── Output
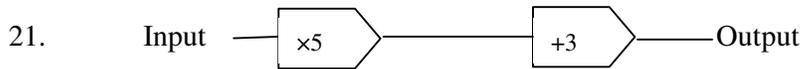
a)  If the input is 3, what is the output?       _____
b)  If the output is 48, what is the input?      _____

22.  My watch started going backwards at the same pace as it should have
     gone forward at 2.20 pm yesterday.  Later that same day it read 1.25 pm.
     What was the actual time?                                        _____

23.

$$(1+1)^2 = 1^2 + 1 + 1 + 1 = 4$$
$$(2+1)^2 = 2^2 + 2 + 2 + 1 = 9$$
$$(3+1)^2 = 3^2 + 3 + 3 + 1 = 16$$
$$(4+1)^2 = 4^2 + 4 + 4 + 1 = 25$$

If   $25^2 = 625$ , use this pattern to find $26^2$ _____

SPACE FOR WORKING

24. Pyramid numbers are formed as follows:

The first pyramid number is      1
The second pyramid number is   $1 + 4 = 5$
The third pyramid number is     $1 + 4 + 9 = 14$
The fourth pyramid number is   $1 + 4 + 9 + 16 = 30$

The fifth pyramid number is       _____

The sixth pyramid number is      _____

The seventh pyramid number is   _____

What do we call the types of numbers we are adding to get each of
these pyramid numbers?         _____

25.                     **Holiday Insurance Premiums**

Free for children under 4 years, reduced rate for children aged between 4 and 13 years
inclusive.

|  | Adults | Children |
|---|---|---|
| Up to 3 days | £10.00 | £6.00 |
| Up to 6 days | £12.40 | £7.60 |
| Up to 9 days | £13.80 | £8.90 |
| Up to 17 days | £19.80 | £12.20 |
| Up to 24 days | £23.40 | £15.40 |
| Up to 31 days | £26.00 | £18.00 |

The table shows holiday insurance premiums.
a) What is the holiday insurance premium for an adult for
                           I) a 16 day holiday _____
                           ii) a 4 week holiday _____
b) Calculate the total holiday insurance premium for a family of four
    (mother, father, daughter aged 9, son aged 3), taking a 2 week holiday. _____

SPACE FOR WORKING

26.
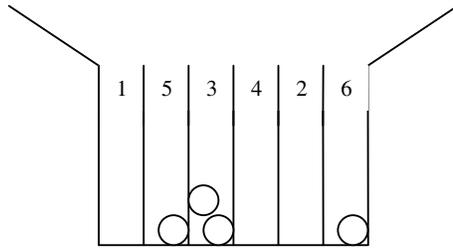


Eric plays Roll-a-Ball at the fairground. He has to roll six balls, all of which must score. When he has rolled four balls, the position is as shown. So far, he has scored

$$5 + 3 + 3 + 6 = 17$$

Winning totals are

$$6, 10, 18, 20, 25, 29, 32, 36$$

a) Which of these winning totals can Eric still achieve?     _____
b) List all the possible ways in which he can score 8 with the
   last 2 balls.

   _____

27. A jogger usually runs for 60 minutes once a week for a distance of 5 miles. What is his
    average speed in miles per hour?

    _____

    On one week's jog, he stops for a rest for 20 minutes after running just 2 ½ miles at his
    usual speed. How fast would he need to run in miles per hour in order to be back home at
    the usual time?

    _____

28. Here is a quick way of adding numbers:

$$1+ 2+ 3 = \frac{3' \ 4}{2} = \frac{12}{2} = 6$$

$$1+ 2+ 3+ 4 = \frac{4' \ 5}{2} = \frac{20}{2} = 10$$

$$1+ 2+ 3+ 4+ 5 = \frac{5' \ 6}{2} = \frac{30}{2} = 15$$

   Use this method  to find,

$$1+ 2+ 3+ 4+ .........+ 99+ 100 = \text{_____}$$

$$50+ 51+ 52+ ..........+ 99+ 100 = \text{_____}$$
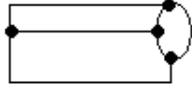
SPACE FOR WORKING

29.  in **Topology**, a point with at least one path leading from it is called a <u>node</u>.

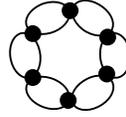Any path joining two nodes is called an <u>arc</u> .

An area surrounded by arcs is called a <u>region</u> .( Even the area outside a shape is a region.)

Complete the following table for each of the figures.( The first one is done for you.)
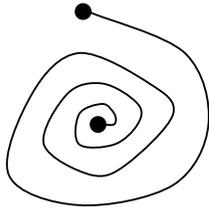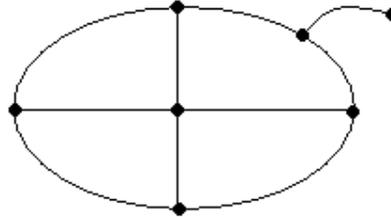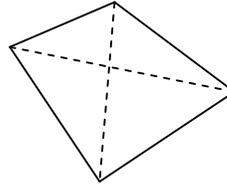
1.

2.

3.

4.

| Figure | Nodes(N) | Regions(R) | Arcs(A) |
|--------|----------|------------|---------|
| 1 | 4 | 4 | 6 |
| 2 | | | |
| 3 | | | |
| 4 | | | |

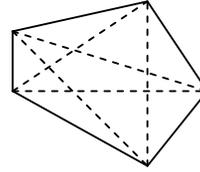Can you find a connection between the nodes(N), regions(R) and arcs(A)?

_____

SPACE FOR WORKING

30. This quadrilateral has 2 diagonals.

This pentagon has 5 diagonals.

How many diagonals does a hexagon have?        _____

How many diagonals does an octagon have?        _____

Complete the following table:

| Number of sides | Number of diagonals |
|---|---|
| 3 | |
| 4 | 2 |
| 5 | 5 |
| 6 | |
| 7 | 14 |
| 8 | |
| n | |
| 20 | |

SPACE FOR WORKING

**NOW GO BACK AND CHECK YOUR ANSWERS CAREFULLY**