# ST EDWARD'S
# OXFORD

# 13+ SCHOLARSHIP EXAMINATION
## 2011

# MATHEMATICS
# Paper 1

## 1 hour

Name: _____

There are 60 marks available.

Calculators are allowed.

Write all answers, including your workings, in this booklet.

1.   Pam bought a box of 40 oranges for £2.

$\dfrac{3}{10}$ of the 40 oranges were damaged so she threw them away.

She sold the remaining oranges at $x$ pence each.
She made a profit of 40%.

Calculate the value of $x$.

$x = $ ……………………..
(Total 5 marks)

2.   (a)   Use your calculator to work out

(i)   $2.4^3$

………………………….

(ii)   $\sqrt{39.69}$

………………………….

(2)

(b)   Use your calculator to work out the value of

$$\dfrac{(7.91 - \sqrt[3]{81}) \times 4.32}{6.23 + 1.491}$$

Give your answer correct to 3 significant figures.

………………………….

(3)
(Total 5 marks)

3. A table tennis club has 180 members.
117 of the members are adults and the rest are children.

(a) What percentage of the club's members are adults?

………………….%

(2)

The ratio of the number of right-handed members to the number of left-handed members is 11 : 1.

(b) How many of the 180 members are right-handed?

……………….

(2)

(Total 4 marks)

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4. (a) Simplify

(i) $3g + 5g$

................................

(ii) $2r \times 5p$

................................

(2)

(b) Expand    $5(2y - 3)$

................................

(1)

(c) Expand and simplify

$2(3x + 4) - 3(4x - 5)$

................................

(2)

(Total 5 marks)

**5.** This formula is very important in the study of mechanics.

$$D = ut + kt^2$$

$u = 20$
$t = 1.2$
$k = -5$

(a) Work out the value of $D$.

.....................................

(2)

$D = 50$
$t = 5$
$k = -5$

(b) Work out the value of $u$.

.....................................

(2)

(c) Make $u$ the subject of the formula

$$D = ut + kt^2$$

$u = $ .....................................

(2)

(Total 6 marks)

6. (a) Solve $7x + 18 = 74$

$x =$ ………………………
(2)

(b) Solve $4(2y - 5) = 32$

$y =$ ………………………
(2)

(c) Solve $5p + 7 = 3(4 - p)$

$p =$ ………………………
(3)
(Total 7 marks)

7. Here are the first four terms of an arithmetic sequence.

3     7     11     15

Write down, in terms of $n$, an expression for the $n$th term of the sequence.

………………………
(Total 2 marks)

8.  Three rock bands played at a music festival.
    The names of the bands were The Rebels, ATC and Wand

    100 teenagers were asked which band they had enjoyed most.
    The two-way table gives information about their replies.

    Complete the two-way table.

|  | The Rebels | ATC | Wand | Total |
|---|---|---|---|---|
| Male | 11 | | 15 | 32 |
| Female | | 18 | | |
| Total | 33 | | | 100 |

(Total 3 marks)

9.  $A$ and $B$ are points on a centimetre grid.
    $A$ is the point (3, 2).
    $B$ is the point (7, 8).

    Calculate the distance $AB$.
    Give your answer correct to 3 significant figures.

    …………… cm

    (Total 3 marks)

10. The mass of 5 $m^3$ of copper is 44 800 kg.

    (a)  Work out the density of copper.

    …………………………… kg/$m^3$

    (2)

The density of zinc is 7130 kg/m$^3$.

(b)     Work out the mass of 5 m$^3$ of zinc.

………………………… kg

(2)

**(Total 4 marks)**

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**11.**     20 students scored goals for the school hockey team last month.
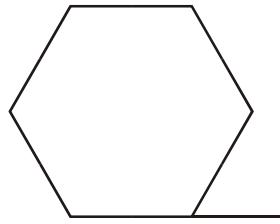The table gives information about the number of goals they scored.

| Goals scored | Number of students | |
|---|---|---|
| 1 | 9 | |
| 2 | 3 | |
| 3 | 5 | |
| 4 | 3 | |

Work out the mean number of goals scored.

..........................
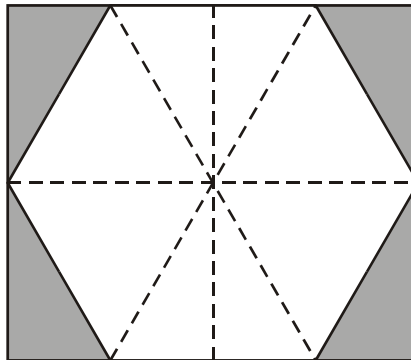
**(Total 3 marks)**

**12.** (a) Work out the size of an exterior angle of a regular hexagon.



..........................°

(2)

A regular hexagon is made from a rectangular piece of metal.
This is done by removing the four congruent triangles shown shaded in the diagram.



The **total** area of the four shaded triangles is 600 cm$^2$.

(b) Find the area of the hexagon.

..................... cm$^2$

(3)

(c) Change 600 cm$^2$ to m$^2$.

..................... m$^2$

(2)

(Total 7 marks)

**13.** (a) Simplify

(i) $\dfrac{x^6}{x^2}$

.....................................

(ii) $(y^4)^3$

.....................................

(2)

(b) Expand and simplify $(t + 4)(t - 2)$

.....................................

(2)

(c) Write down the integer values of $x$ that satisfy the inequality

$$-2 \leq x < 4$$

.................................................................

(2)

(Total 6 marks)

## End of Exam