Godolphin Latymer

YEAR 7

ENTRANCE EXAMINATION

Friday 11th January 2008

MATHEMATICS

Time: I hour 15 minutes

Name:_____

Instructions:

Only use a pencil and a rubber

Work through the paper carefully without rushing.

Do your work clearly in the space near each question.

Do not rub out your working: you may get marks for it.

If you cannot answer a question go on to the next one.

No calculators or rulers allowed.

	Marker	Checker	
Section A			34
Section B			36
Section C			30
	Total		100

1.
```
    5 7 8 4
  +   4 1 9
   6,2'03
```
6,203

2.
```
  1 2⁵8'0 5
  −   8 3 2
    1,7 7 3
```
1,773

3.
```
      9 2 7
  ×       7
   6'4 ⁶8 9
```
6,489

4.
```
      3706
  8)29⁶648
```
3,706

5. Write down the number which is 5 less than eight thousand and three.

$$8,003 - 5$$

```
  7⁸⁹8'Ø'Ø'3
  −        5
   7 9 9 8
```

7,998

6. Fill in the missing numbers to make the sum correct.

$$
\begin{array}{r}
3\ \boxed{7}\ 5 \\
+\quad \boxed{4}\ 8\ 7 \\
\hline
8\quad 6\quad 2 \\
\end{array}
$$

7. A chocolate bar costs 36p. How many can Nikita buy for £3.00?

$300 \div 36$

36×5

$\begin{array}{r} 36 \\ \times\ 5 \\ \hline 180 \end{array}$ 180

$\begin{array}{r} 36 \\ 8 \\ \hline 288 \end{array}$ → we cannot add another 36

$\underline{\quad\quad 8 \quad\quad}$

8. There are 24 children in Alfie's class. Five eighths of the class have school lunch. How many children have school lunch?

$(24 \div 8) \times 5$

$= 3 \times 5$

$= 15$

$\underline{\quad\quad 15 \quad\quad}$

9. Fill in the missing numbers in each of these number patterns:

a)   2 $\overset{+6}{}$ 8 $\overset{+6}{}$ 14 $\overset{+6}{}$ 20 _26_ 32 _38_

b) _1_ $\overset{\times 3}{}$ 3 $\overset{\times 3}{}$ 9 27 _81_ 243

c)   8   6½ $\overset{-1½}{}$ 5 _3½_ 2 _½_

27
3
─────
²8 1

10. What fraction of the parallelogram below is shaded?
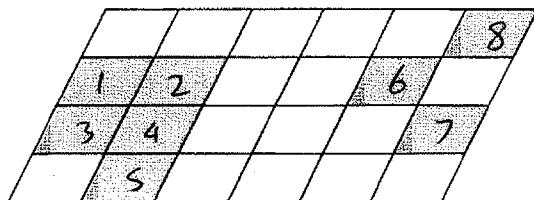
$$\frac{8}{24} = \frac{4}{12} = \frac{1}{3}$$

_¹/3_

11. Write down the number between 41 and 51 which is divisible by both 3 and 4.

3 × 4 = 12 ×
24 ×
36 ×
48 ✓

_48_

12. Jenny pays £156 for six nights Bed and Breakfast accommodation. How much would it cost her to stay there for 8 nights?

$$6 \overline{)156} = £26 \text{ per day}$$

$$\begin{array}{r} 26 \\ \times \ 8 \\ \hline 2^40 8 \end{array}$$

£208

13. a) Dita watched television from 5:35pm until 7:10pm. How long did she spend watching television?

$5:35 \to 6:00 = 25$ mins
$6:00 \to 7:10 = 1$ hour 10 mins

$1:10 + 0:25 = 1:35$

1 hour 35 mins

b) Dita watches the television for 2 hours 45 minutes each weekend. How much time does she spend watching television over three weekends?

$2 \times 3 = 6$ hours PLUS

6 hours + 2 hours 15 mins

$$\begin{array}{r} 45 \\ \times \ 3 \\ \hline 1 3 5 \text{ mins} \end{array}$$
$= 2$ hours 15 mins

8 hours 15 mins

14. Arrange these numbers in order, starting with the smallest.

0.7   0.75   0.80   0.65   (less than 0.5)
      3/4   4/5   five twelfths

five
twelfths   0.65   0.7   3/4   4/5

15. Shade the diagram so that the dotted line is line of symmetry.
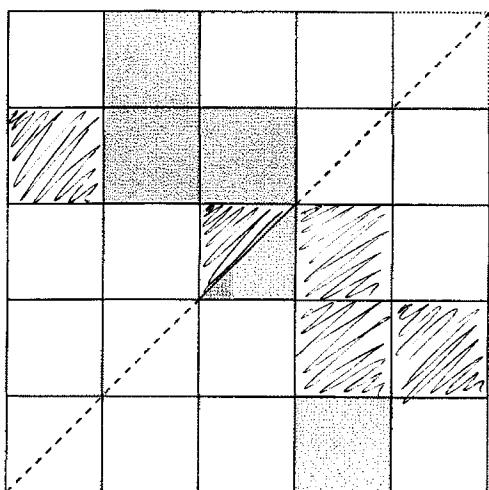
16. Jamie got seven questions wrong in a test out of 25 questions. What percentage of the questions did he get wrong?

$$\frac{7 \times 4}{25 \times 4} = \frac{28}{100} = 28\%$$

28%

17. The second hand of a clock points to the number 2. After one minute and twenty seconds what number will it be pointing to?

number 2 = 10 seconds

\+ 1 minute = still 10 secs

\+ 20 secs = 30 secs

30 secs = 6

_____6_____

18. Charlotte buys 500g of cheese which costs £5.30 per kilogram, six bananas at 15p each and two chocolate bars at 56p each. How much change will she have from a ten pound note?

$$\begin{array}{r} 2.65 \\ 2\overline{)5'3'0} \end{array} = £2.65$$

cheese	£2.65	$6 \times 15 = 90$
bananas	£0.90	$\begin{array}{r} 56 \\ \times\ 2 \\ \hline 112 \end{array}$
chocolate bars	£1.12	

$$\begin{array}{r} 2\,65 \\ 90 \\ +\ 1\,12 \\ \hline 4\,6\,7 \end{array}$$

change _____£5.33_____

$$\begin{array}{r} 10\,0\,0 \\ -\ 4\,6\,7 \\ \hline 5.33 \end{array}$$

19. Hui Ling measures her pencil before she sharpens it.
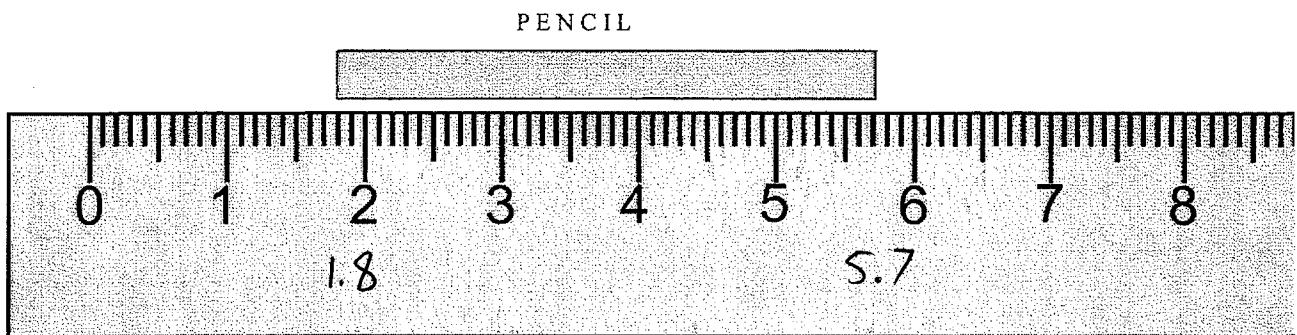
PENCIL

What is the length of the pencil?

$$\begin{array}{r} ^4\cancel{8}.7 \\ 1.8 \\ \hline - 3.9 \end{array}$$

3.9 cm

20. Arrange the letters for each of these events in order, starting with the <u>least</u> likely:

A   *Rolling a dice and getting a three*   1/6
B   *Rolling two dice and getting a total of 15*   0
C   *The next person who walks in the door was born on a Wednesday*   1/7
D   *The last digit of a telephone number is NOT a 9*   9/10

B	C	A	D
Least likely			Most likely

21. Maria telephoned Priya on her mobile. The rate for the first three minutes was 7p per minute. After that the telephone call cost 5p per minute. The telephone call lasted 21 minutes. How much did it cost?

$3 \times 7 = 21p$
$18 \times 5 = 90p$

$111p = £1.11$

£1.11

22. Which two shapes can be fitted together to make the larger shape?

1.   2.   3.   4.
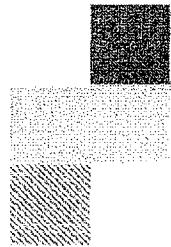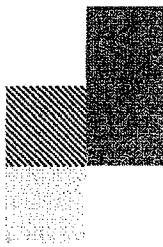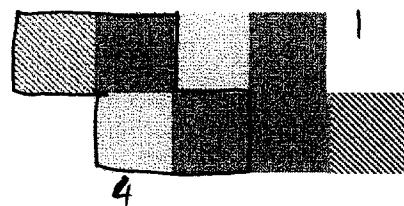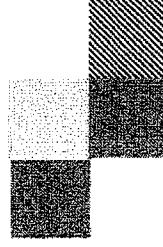
1 and 4

23. 15 x 34 = 510

Use this information to work out:

a.   150 x 340 $510 \times 10 \times 10$ *510 00*

b.   15 x 17 $510 \div 2$ *255*

c. $510 \div 17 = 15 \times 2$ *30*

24. Clara has four brothers.
Sam's age added to Ben's age gives 12.
The total of Frederick's and Sam's and Ben's ages is 28.
Mylo's age added to Sam's age gives 20.
The total of all the brothers' ages is 39.

Work out the ages of Clara's brothers.

② - ①

① $S + B = 12$

$= 28 - 12 = 16$
only $F \to 16$

② $F + S + B = 28$

③ $M + S = 20$ Sam ___9___

9

④ $M + F + S + B = 39$ Ben ___3___

$+\,^{16}_{\;\;3}$

③ $\quad$ sub ③ into ④ Frederick ___16___

28

16 + 20 + B = 39 Mylo ___11___

39
−28

$B + 36 = 39$

11

$B = 3$

25. The time in Australia is 9 hours ahead of our time in the UK.

a) I wish to ring a friend in Australia so that for them the time is between 6.30 pm and 8.30 pm. Between what times in the UK should I ring them?

6:30pm − 9 hours = 9:30am
8:30pm − 9 hours = 11:30am

___9:30 − 11:30am___

The time in the USA is 5 hours behind UK time.

b) What time is it in Australia when it is 4 am in the USA?

4am + 5

= 9am

___6pm___

9am + 9 = 6pm

26. | 8 | 3 | 5 | 4 | 9 |

Using all these digits once only make

a) the largest number | 9 | 8 | 5 | 4 | 3 |

b) the largest number
   divisible by 4 | 9 | 5 | 3 | 8 | 4 |

c) the smallest even
   number | 3 | 4 | 5 | 9 | 8 |

27. Zac had a 24 hour digital clock.
2am is shown as 02:00 and 8.35pm is shown as 20:35.
The numbers glow in the dark.
The numbers are displayed as shown.

0 1 2 3 4 5 6 7 8 9

What is the time when the glow from the clock is least?

What is the time when the glow from the clock is greatest?

least glow ____11 : 11____

greatest glow ____08 : 08____

28. At a party all the children were put into groups of 4 to play a game. Two children had to sit out. $\div 4$, $r\ 2$

For another game they were put into groups of 5. Two children had to sit out. $\div 5\ r\ 2$

For the next game they were put into groups of 6. No one had to sit out. $\div 6$

How many children were at the party?

6
12
18
24
30
36

42 ✓

___42___

29. Write down how many cubes and triangular blocks are used to make the ship shown below.
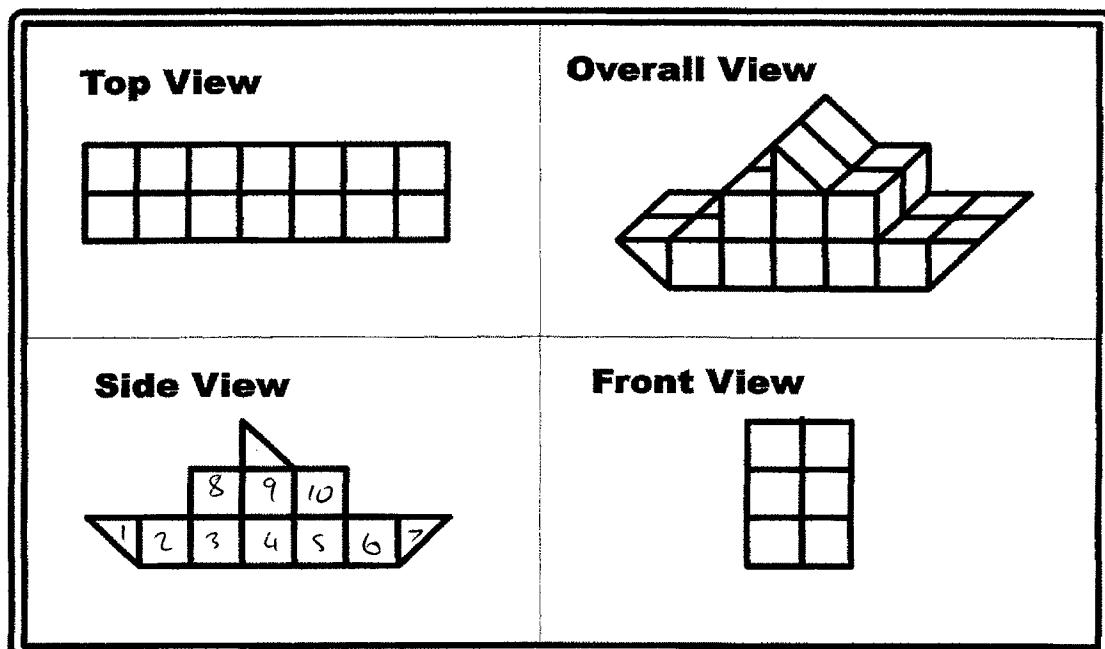
cubes = 8 × 2
triangles = 3 × 2

Cubes: ___16___

Triangular blocks: ___6___

30. A B and C represent different digits.

must be 40something   so A must be 4

A B + C = 50

B C + A = 41

so B + C = 10

and BC = 37
B = 3
C = 7

What are the values of **A**, **B** and **C**?

TRIAL + ERROR

A   ___4___

B   ___3___

C   ___7___

31. This shape is made from 9 identical squares.
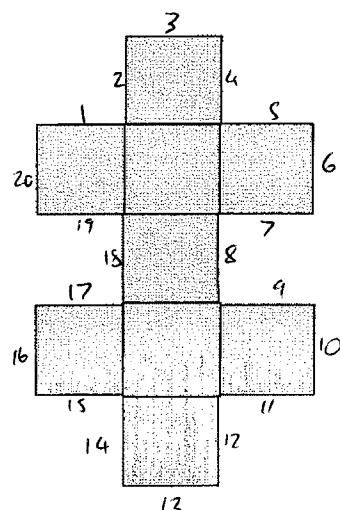
The area of the shape is 144cm².
What is the perimeter of the shape?

$\begin{array}{r} 1\ 6 \\ 9\overline{)1\,4^5 4} \end{array}$

16 — so side
= 4

20 × 4
= 80

___80cm___

32. Look carefully at this example to see how the 4 numbers in the corners of the square are used to make the number in the middle.

```
 3              2
      ( 10 )
 4              6
```
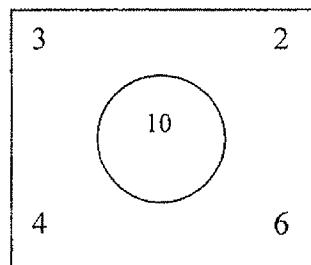
3 x 6 – 4 x 2
= 18 – 8
= 10
So 10 goes in the middle

(a) Find the missing numbers in each of the following.

```
 4              4
      ( 16 )
 3              7
```

$4 \times 7 = 28$
$3 \times 4 = 12$
$28 - 12 = 16$

```
 7              5
      ( 25 )
 2              5
```
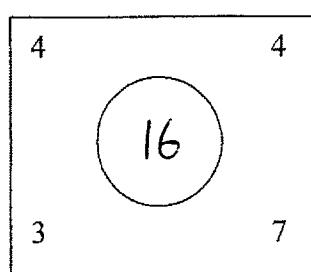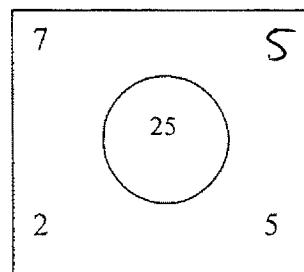
$7 \times 5 = 35$
$35 - x = 25$
$x = 10$
$2 \times 5 = 10$

(b) In each of these squares the 2 missing numbers are the same. Fill in the missing numbers.

```
 7              3
      ( 34 )
 5              7
```
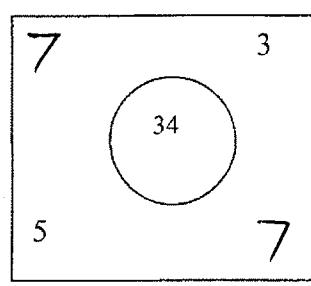
$x \times x = ?$
$5 \times 3 = 15$
$? - 15 = 34$
$? = 49$
$x \times x = 49$
$x = 7$

```
 8              12
      ( 8 )
 4              7
```
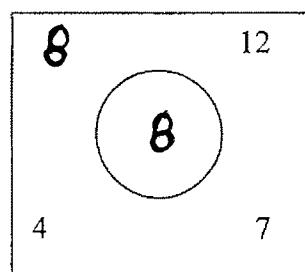
$x \times 7 = ?$
$4 \times 12 = 48$
$7x - 48 = x$
$48 = 6x$
$8 = x$

(c) None of the missing numbers in this square is the same. Fill in 4 numbers which would work.

$8 \times 7 = 56$
$4 \times 12 = 48$

```
 2              6
      ( 0 )
 1              3
```

$2 \times 3 = 6$
$6 \times 1 = 6$
$6 - 6 = 0$ ✓

or

```
 4              6

      0

 2              3
```

etc.
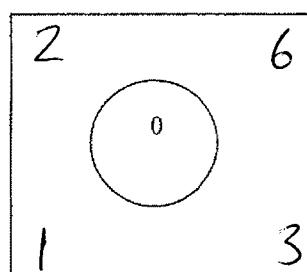
33. Here is a sequence of whole numbers

$$7 \quad 22 \quad 11 \quad 34 \quad 17$$

The rule for the next number in the sequence is:

- if the last number is odd then multiply it by 3 and add 1

- if the last number is even then halve it.

In the following sequence the first three numbers have been left out. Fill in the numbers to show three different possible sequences which obey the rule above.

| 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 | 4 |

| 20 | 10 | 5 | 16 | 8 | 4 | 2 | 1 | 4 |

| 3 | 10 | 5 | 16 | 8 | 4 | 2 | 1 | 4 |

34. Three pet rabbits cost £19.70.
The second rabbit cost £2 more than the first.
The third rabbit cost 80p less than the second.
What is the cost of the first rabbit?

① $a + b + c = 19.70$

② $b - a = 2$

③ $b - c = 0.8$

$$\begin{array}{r} 19.7 \\ +\ 2.0 \\ 0.8 \\ \hline 22.5 \end{array}$$

add them all

$a + b + c + b - a + b - c = 22.5$

$3b = 22.5$

$$\begin{array}{r} 7.5 \\ 3\overline{)22.5} \end{array}$$

$\underline{£5.50}$

second rabbit $= £7.50$

$£7.50 - £2 = £5.50$

35. Sarah spilt juice all over her calculator. Now only the five
    buttons shown work, as well as the equals and clear
    buttons.
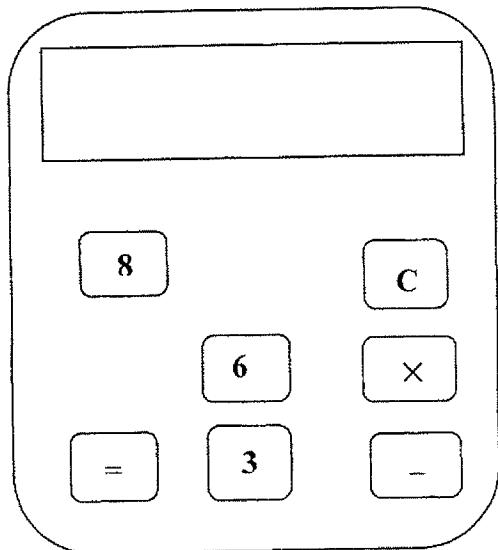
C is the clear button.

= is the equals button.

The other working buttons are:

3 6 8 × −

Buttons can be used as many
times as you like.

Starting with the clear button, show how to use five more
buttons to make the answer shown.

a) C 6 × 8 − 3   = 45

b) C 3 × 3 − 8   = 1

c) C 3 8 − 6   = 32

36. Zoe, Laura, Sam, Ali and Craig each gave one of the others a present. No one got two presents.

Laura received a CD. Ali received a book. Craig gave a video. Ali gave a scarf, but not to Craig. Sam gave a puzzle and did not receive the scarf.

Fill in the spaces to show who received which present from whom.

Zoe received _Scarf_ from _Ali_

Laura received _CD_ from _Zoe_ (not Craig)

Sam received _Video_ from _Craig_

Ali received _Book_ from _Laura_ (not Craig)

Craig received _Puzzle_ from _Sam_

37. In this number sequence two numbers next to each other are added together to give the following number.

    5   3   8   11   19
___   ___   ___   ___   ___

Find the missing numbers in the sequence.

38. On ordinary dice the number of spots on opposite faces add up to 7.

(a) How many spots are on the face opposite the one with 3 spots?
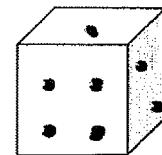
<u>   4   </u>

Rajni is playing with some dice. She places them on a table and adds up all the spots she can see.

For example in this case she can see 15 spots.
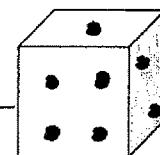
(b) How many spots can she see in the cases below?
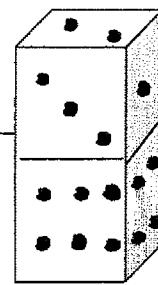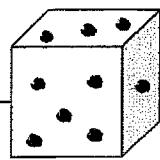
<u> 17 </u>   <u> 30 </u>

(c) Rajni tries arranging 2 dice on the table. What is the smallest number of spots she can see if she arranged them:
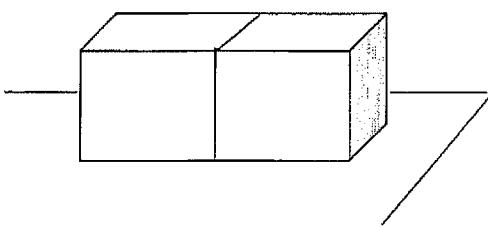
like this?   or like this?
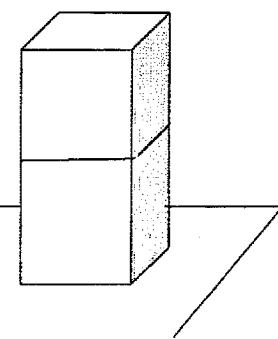
<u>   20   </u>   <u>   29   </u>

39. The different shapes stand for eleven of the numbers from 0 to 12.

Each shape is a different number.

■ × ■ × ■ = ◗   ▮ × ▮ = ☆

■ × ⬭ = ◗   ■ × ✦ = ⬢

▮ × ⬭ = ●   ▮ × ◇ = ▮

▮ × ■ = △   ◇ × ⬡ = ⬢

△ × ■ = ●   ■ × ▼ = ▼

■ × ■ = ⬭   ▼ × ◗ = ▼

Can you work out what they are from the multiplications above?

⬢ = 10   △ = 6

no other cube numbers possible → ■ = 2   ⬭ = 4 (as $2 \times x = 8$, $x = 4$)

☆ = 9 $(3 \times 3 = 9)$ ◇ = 1 (using $\square \times \diamond = \square$)

▮ = 3 (only other possible square)   ● = 2

▼ = 0 (anything ×0 = 0)   ✦ = 5 ($2 \times x = 10$, $x = 5$)

◗ = 8 (as $2 \times 2 \times 2 = 8$)