SOUTHERN AFRICAN PRIMARY MATHEMATICS OLYMPIAD
FEMSISA MATHEMATICS OLYMPIAD
(SAPMO)
GRADE FOUR
FINAL ROUND
DATE: 1 SEPTEMBER 2011
TIME: 120 MINUTES

Instructions:

1. This booklet has 20 questions.

2. Use the answer sheet provided. Enter your answer in the block.

3. All working details must be done in the space provided.

3. Calculators are not permitted.

4. Diagrams are not necessarily drawn to scale.

5. The first 15 problems carry one mark each and the next 5 carry 2 marks each.

6. You have 120 minutes for the paper which works out to an average of 6 minutes per question.

7. Read the questions carefully before answering.

8. Visit the website: www.mathematics-forall.com
GRADE FOUR: 2011 FINAL ROUND

1. Write down the 7th number of this addition sequence.
   5; 9; 13; 17; ...

2. Find the value of
   \[ \square + \square = 75 - \square \]

3. Sarah was in the middle of the queue. She was in position 41 from the front. How many people were in the queue?

4. Jes counted in 3’s as follows:-
   15; 18; 21; 24; ...
   She stopped at the 60th number. What number did she count last?

5. Guess the number I stand for.
   - I am a 3 digit number.
   - My ten’s digit can be counted in 3’s.
   - The sum of my digits is 17.
   - My hundred’s digit is 1 more than my ten’s digit.

6. In this subtraction certain digits have been replaced by letters. What is the value of A + B?
   \[
   \begin{align*}
   &A 0 0 \\
   &B A 4 \\
   &2 B A
   \end{align*}
   \]

7. In the game below called “PYRAMATHS’ the sum of the 2 numbers in the 2 boxes underneath gives the number in the box above it. Find the number that should replace X.

```
   48
  /   \
X  X
```

\[
X + X + 18
\]
8. Four houses P; Q; R and S are on a straight road. The distance from P to R is 140 metres. The distance from Q to S is 180 metres and from P to S is 240 metres.

What is the distance from Q to R?

9. If half of a certain number is 48 then what is one third of this number?

10. Cindy has 4 times as much money as Terry. If both have R800 then how much does Cindy have?

11. How many lines of symmetry does this figure have?

12. A container is \( \frac{3}{4} \) full of juice. When 20 litres are removed then it is half full. What is the capacity of the container when full?

13. The cost of 7.5 litres of spring water is R18. What would you pay for 2 litres of water at the same rate?

14. If the date on Friday is 14th then what is the date of the 3rd Wednesday of the month?
15. How many triangles of all sizes in this figure?

16. At a Christmas party each child took a present for each of their friends. There were 110 presents altogether. How many children were at the party?

17. Study the following problem. Do you know what © is doing to the 2 numbers?

\[
\begin{align*}
4 \odot 3 &= 5 \\
3 \odot 1 &= 5 \\
6 \odot 2 &= 10 \\
\end{align*}
\]

After you have discovered what © does then find the answer to

\[
9 \odot 3
\]

18. 5 packets of chips cost R4.99. What will 15 such packets of chips at the same rate cost?

19. Denny has 3 plastic digits. These digits are 4; 6; and 7
Find the sum of all 3 digit numbers that can be made from these digits.

20. How many 3 digit numbers from 100 to 300 have 3 odd digits?

\[
\begin{align*}
\text{TOTAL: } 15 \times 1 &= 15 \\
5 \times 2 &= 10 \\
\end{align*}
\]

\[
25
\]
SOUTHERN AFRICAN PRIMARY MATHEMATICS OLYMPIAD

FEMSISA MATHEMATICS OLYMPIAD

(SAPMO)

GRADE FIVE

FINAL ROUND

DATE: 25 AUGUST 2011

TIME: 120 MINUTES

Instructions:

1. This booklet has 20 questions.

2. Use the answer sheet provided. Enter your answer in the block.

3. All working details must be done in the space provided.

4. Calculators are not permitted.

5. Diagrams are not necessarily drawn to scale.

6. The first 15 problems carry one mark each and the next 5 carry 2 marks each.

7. You have 120 minutes for the paper which works out to an average of 6 minutes per question.

8. Read the questions carefully before answering.

9. Visit the website: www.mathematics-forall.com
1. Write down the 10\textsuperscript{th} number of this addition sequence.
   
   11; 16; 21; 26; …

2. Find the value of

   \[ 96 - \square = \square + \square + \square \]

3. Tim was 2 positions to the left of the middle of the queue. She was in position 47 from the left numbered from 1. How many people were in the queue?

4. Jes counted in 4’s as follows:-
   
   12; 16; 20; 24; …
   
   She stopped at the 80\textsuperscript{th} number. What number did she count last?

5. Guess the number I stand for.
   
   • I am a 3 digit number.
   • My ten’s digit can be counted in 2’s.
   • The sum of my digits is 19.
   • My hundred’s digit is twice my ten’s digit.

6. In this addition certain digits have been replaced by letters. What is the value of A + B + C?
   
   \[
   \begin{array}{c}
   A \\
   B \\
   C \\
   \hline
   A \\
   B \\
   C \\
   6 
   \end{array}
   \]

7. In the game below called “PYRAMATHS’ the sum of the 2 numbers in the 2 boxes underneath gives the number in the box above it. Find the number that should replace X.

   \[
   \begin{array}{c}
   48 \\
   \hline
   X \\
   X \\
   X \\
   \end{array}
   \]
8. Four houses P, Q, R and S are on a straight road. The distance from P to Q is twice the distance from R to S. The distance from Q to R is 180 metres less than the distance from P to Q. If the distance from P to S is 900 metres then what is the distance from R to S?

9. If one third of a certain number is 48 then what is one sixth of this number?

10. Andy has one and half times as much money as Beckam. If both have R750 000 then how much does Andy have?

11. How many lines of symmetry does this regular hexagon have?

12. A container is \( \frac{2}{3} \) full of water. When 120 litres are removed then it is \( \frac{1}{4} \) full. What is the capacity of the container when full?

13. When Des counted the sweets in 4’s he had 3 left. When he counted in fives he had two left over. When he counted in 3’s he had none left over. What is the smallest number of sweets Des had?

14. Study the following arrangement of numbers:

\[
\begin{array}{ccccc}
1 & 2 & 3 & 4 \\
5 & 6 & 7 & 8 & 9 \\
\end{array}
\]

What is the 2\textsuperscript{nd} number of 21\textsuperscript{st} row?
15. In the game called Arithmogons the sum of the 2 numbers in the 2 circles gives the number in the square between them.

If \(A + B = 40\) then find the value of \(A\).

16. Thembi wrote down a two digit number. Thembi then reversed the digits (example 36 becomes 96). She obtained a new number. She then added the two numbers to obtain the answer 110. What is the sum of the digits of this number?

17. Penny has as many R2 coins as R5 coins. If the total value of the coins is R1400 then what is the value of R5 coins?

18. Goodness is 5 years less than half her mother’s age. In 10 years time her mother will be 50. What is Goodness’s age?

19. Write down the sum of the digits of the following product. 
\[99999 \times 66666\]

20. Colour beads red(R) and white(W) were used to make a necklace. The beads were arranged as follows:
R W R W R W W R W W W R W W W W W R…..
This necklace had 98 beads. How many red beads were there?

\[
\text{TOTAL: } 15 \times 1 = 15 \\
5 \times 2 = 10 \\
25
\]
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8. Visit the website: www.mathematics-forall.com
GRADE SIX: 2011 FINAL ROUND

1. Write down the 7\textsuperscript{th} number of this addition sequence.

\begin{align*}
&2; 2; 4; 6; 10;\ldots
\end{align*}

2. Find the value of

\[120 - \square = \square \times \square + \square\]

3. When Happiness added the 5 numbers of the Thursdays in the month she obtained the answer 75. What is the date of the 2\textsuperscript{nd} Thursday of the month?

4. Find A \times B \times C if A; B and C are different.

\[
\begin{array}{c}
\text{ABC} \\
\text{BC} \\
\text{BC} \\
+ \text{BC} \\
\hline
35A
\end{array}
\]

5. Guess the number I stand for.
- I am a 3 digit number.
- My ten’s digit is 2 more than my unit’s digit.
- My hundred’s digit is 1 more than the ten’s digit.
- The sum of my ten’s and unit’s digit is 10.

6. Evaluate

\[58 \times 7012 + 42 \times 7012 - 100 \times 7012\]

7. Find the sum of:

\[1 \times 1 \times 1 + 2 \times 2 \times 2 + 3 \times 3 \times 3 + \ldots + 50 \times 50 \times 50\]

8. One quarter of a number more than the number exceeds the number by 3. Find the number.
9. How many squares of all sizes are there in this figure?

10. This tower is 3 storey high and is made up of cubes. How many cubes would be needed to build a tower 30 storey high?

11. Five towns are on the same straight road. Peacevale is 25km to the left of Sunny. Richness is 9km to the right of Peacevale. Carefree is 3km to the left of Flower. Flower is 10 km to the right of Richness. How far and in what direction is Carefree from Sunny?

12. Determine the area of the shaded region

13. It takes 9 minutes to cut a log into 4 pieces. Jacob cuts a similar log into 6 pieces working at the same rate. At what time did Jacob start cutting the log if he completed the job at 09:20 without having any rest?

14. The average mark of 10 learners in a Mathematics Test is 14 whist the average mark of the 9 learners is 15. What is the mark of the 10th learner?

15. Write down the last 4 digits of this product.
   \[ 55555555 \times 7777777 \]
16. How many zeros does the following product end in?
   \[22 \times 21 \times 20 \times 19 \times 18 \ldots \times 3 \times 2 \times 1\]

17. My watch loses 5 minutes every hour. The time was correct at 08:10. What was the actual time when the watch shows 12:02?

18. In a basketball match, points were scored in only 2's and 3's. Aces scored 85 points from 35 shots. How many 2 pointers did the team score?

19. Calculate the sum of these fractions:
   \[\frac{1}{1.3} + \frac{1}{3.5} + \frac{1}{5.7} + \ldots + \frac{1}{21.23}\]

20. 2 lines divide the plane into 4 regions.
   3 lines divide the plane into 7 regions

   How many regions will 15 lines divide the plane?

   TOTAL: 15 \times 1 = 15
   5 \times 2 = 10

   25
SOUTHERN AFRICAN JUNIOR MATHEMATICS OLYMPIAD
FEMSISA MATHEMATICS OLYMPIAD
(SAJMO)
GRADE SEVEN
FINAL ROUND
DATE: 1 SEPTEMBER 2011
TIME: 120 MINUTES

Instructions:
1. This booklet has 20 questions.
2. Use the answer sheet provided. Enter your answer in the block.
3. All working details must be done in the space provided.
4. Calculators are not permitted.
5. Diagrams are not necessarily drawn to scale.
6. The first 15 problems carry one mark each and the next 5 carry 2 marks each.
7. You have 120 minutes for the paper which works out to an average of 6 minutes per question.
8. Read the questions carefully before answering.
9. Visit the website: www.mathematics-forall.com
FEMSISA Grade 7 Final Round

1. On a map 12 cm rep 4,8 km. How many metres does 1 cm on the map rep?

2. On Tuesday 14 June 2011 Les was 16 years old. On what day of the week was Les born?

3. 1575 beads are used to make 45 chains. How many beads are needed to make 27 such chains?

4. After painting $\frac{5}{8}$ of the hotel's doors Pete still had 21 doors to paint. How many doors were there altogether?

5. Determine the 2 digit number such that it is 3 times the sum of its digits.

6. A rectangular lawn had paving bricks around the border. The perimeter of the lawn is 40 metres and the area of the lawn is 96 $m^2$. Determine the longer side of the lawn.

7. Penny won a 800 metre race in 2 minutes. Calculate the average speed in km per hour.

8. The Department decided to allocate 64 computers to each school. There were 36 short. The department decided to allocate 48 to each school and retain 140. How many computers did the education department initially have?

9. Evaluate
$$ \frac{4+6+8+\cdots+50}{6+9+12+\cdots+93} $$

10. A water tank is $\frac{1}{4}$ full. When 200 bricks measuring 15 cm by 12 cm by 5 cm are dropped into the tank the water level rises to $\frac{1}{2}$ of the tank. What is the capacity of the tank in litres?
11. The LCM of 2 numbers is 48. If the two numbers are in the ratio 2:3 then find the sum of the 2 numbers.

12. Observe the following pattern

\[
\begin{array}{cccc}
1 \\
3 & 5 \\
7 & 9 & 11 \\
13 & 15 & 17 & 19 \\
\end{array}
\]

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

What is the 3\textsuperscript{rd} number of the 20\textsuperscript{th} row?

13. In a cinema Rogers is seated in the 8\textsuperscript{th} row three from the front and 7\textsuperscript{th} column from the right. He is also seated 18\textsuperscript{th} row from the back and 10\textsuperscript{th} column from the left. How many seats in the cinema?

14. If \( \frac{8}{5} = 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{x}}} \) then find the value of \( x \).

15. All people were evenly spaced around a circle. Number 26 was standing opposite 5. Number 38 was standing opposite 17. How many people were standing on the circumference of the circle?

\[
\begin{array}{cc}
5 & 17 \\
38 & 26 \\
\end{array}
\]
16. 3 buses leave the bus terminal at 06:00. Green takes 16 minutes for a return. Blue takes 20 minutes and Orange takes 12 minutes. They remain for 8 minutes at the terminal. At what time will all 3 leave the bus terminal again?

17. Sally received 2 discounts. The first discount was 20% because it was a sale. He received a further discount of 10% because he is a gold card member. What are these discounts as a single discount?

18. A vendor buys 7 pencils for R6. He sells them at 4 for R7. How many pencils must he sell to make a profit of R1000?

19. A metric clock is constructed with a 8 hour day and 90 minutes per hour. The time on the metric clock is 02:30 (30 minutes past 2). What is the acute angle between the minute hand and the hour hand when the time shows 02:30?

20. Lindy is twice as old as Jes was when she was as old as Jes is now. She is 36 years old. How old is Jes?