basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

WE SUPPORT QUALITY EDUCATION
• LOVE, RESPECT AND ACCEPTANCE FOR ALL •

ANNUAL NATIONAL ASSESSMENT 2015
GRADE 8 MATHEMATICS TEST

MARKS: 125

MARKS	

TIME: 2 hours

PROVINCE _____

DISTRICT _____

CIRCUIT _____

SCHOOL _____

EMIS NUMBER (9 digits)

CLASS (e.g. 8A) _____

SURNAME _____

NAME _____

GENDER (✓)

BOY	

GIRL	

DATE OF BIRTH

C	C	Y	Y	M	M	D	D

This test consists of 20 pages, excluding the cover page.

Instructions to the learner

1. Read all the instructions carefully.

2. Question 1 consists of 10 multiple-choice questions. You must circle the letter of the correct answer.

3. Answer questions 2 to 11 in the spaces provided.

4. All working must be shown.

5. The diagrams are not drawn to scale.

6. Give a reason for each of your statements in questions 7.2 to 7.6, when required.

7. The test is out of 125 marks.

8. The test duration is 2 hours.

9. The teacher will lead you through the practice question before you start the test.

10. Approved scientific calculators (non-programmable and non-graphical) may be used.

Practice question

Circle the letter of the correct answer.

1.   The next number in the number sequence 1 ; 3 ; 5 ; 7 ; … is …

        A   8

        B   12

        C   16

        D   9

Your answer is correct if you circled D.

The test starts on the next page.

QUESTION 1

1.1 $x + x + x =$

     A x^3

     B $3x$

     C $3x^3$

     D $4x$ (1)

1.2   Complete: $(12 \div 2) + (6 \times 3) - 3 =$

     A   105

     B   27

     C   21

     D   33   (1)

1.3   What is the value of x if $\frac{2}{7} = \frac{x}{21}$?

     A   6

     B   7

     C   11

     D   14   (1)

1.4   The next term in the sequence 1 ; 3 ; 9 ; __ is …

     A   24

     B   12

     C   18

     D   27   (1)

1.5 The value of $\sqrt[3]{125} =$

A 5

B −5

C 25

D 15 (1)

1.6 How many terms are there in the expression $-6x^4 + 4x^3$?

A 1

B 2

C 3

D 4 (1)

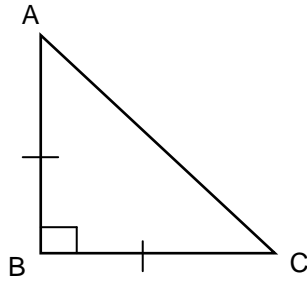1.7 The surface area of a cube is 750 cm². The surface area measured in m² is

A 0,075 m²

B 7,50 m²

C 75,0 m²

D 0,75 m² (1)

1.8   In the right-angled triangle ABC below, $AB = BC$. The size of $\hat{C}$ is ...

A   15°

B   30°

C   45°

D   60°   (1)

1.9 $0{,}15 \times 0{,}3 =$

A   4,5

B   0,45

C   0,0045

D   0,045   (1)

1.10   Which number is missing in the number sequence below?

$1 \, ; \, 1 \, ; \, 2 \, ; \, 3 \, ; \, \_\_ \, ; \, 8 \, ; \, 13$

A   3

B   2

C   5

D   7   (1)

                                                                             [10]

QUESTION 2

2.1   Complete:

2.1.1 $\dfrac{0}{7} =$ _____   (1)

2.1.2 $\left(\dfrac{1}{2}\right)^3 =$ _____   (1)

2.2   Write 12 000 in scientific notation.

_____   (1)

2.3   Answer the following questions.

2.3.1   Write down the LCM of 12 and 48.

_____   (1)

2.3.2   Write down all the factors of 28.

Then, write down the prime factors of 28.

_____

_____   (2)

2.4   Calculate the average speed of a car that travelled 720 kilometres in 6 hours.

_____

_____

_____   (2)

2.5   Fill in the missing number in the number sequence below.

$-1 ; -4 ; -7 ;$ ____ $; -13 ; -16$ (1)

[9]

QUESTION 3

3.1   Calculate each of the following:

3.1.1 $-4 - (-2) + (-3 - 4)$

_____

_____ (3)

3.1.2 $3\frac{2}{3} - \frac{7}{12}$ (Write the answer as a mixed number.)

_____

_____

_____

_____ (4)

3.1.3 $1\frac{2}{3} \times \frac{5}{6}$ (Write the answer as a mixed number.)

_____

_____

_____ (3)

3.1.4 $\frac{2}{5} \div \frac{1}{2}$

_____

_____

_____ (3)

3.1.5   4% of 500

_____

_____

_____   (3)

3.2   Currently my bank balance is R2 000. What will the new balance be if I
       withdraw R600 from the account in each of the next 3 months?

       _____

       _____

       _____   (3)

3.3   Peter ate $\frac{1}{5}$ of his 250 Smarties. How many Smarties were left?

       _____

       _____

       _____   (3)

3.4   Calculate how much interest Mr Jones owed if he borrowed R10 000 at 15% per
       annum, simple interest, for a period of 3 years.

       _____

       _____

       _____

       _____   (4)

                                                                   [26]

QUESTION 4

4.1   Study the pattern in the figures below and then answer the questions that follow.
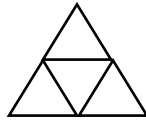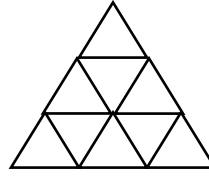
Figure 1   Figure 2   Figure 3

4.1.1   Fill in the missing numbers in the table below:

Figure	1	2	3	4	5
Number of small triangles	1	4	9		

(2)

4.1.2   Write down the general term, T_n, of the number sequence formed by the number of small triangles in the above pattern.

T_n = _____   (1)

[3]

QUESTION 5

5.1 Consider the expression $7x^2 + 5x + 4$ and then answer the questions that follow.

    5.1.1 Write down the constant term.

    _____ (1)

    5.1.2 What is the degree of the expression?

    _____ (1)

    5.1.3 Write down the coefficient of the second term.

    _____ (1)

    5.1.4 Calculate the value of the expression $7x^2 + 5x + 4$ if $x = -1$.

    _____

    _____

    _____

    _____ (3)

5.2 Simplify the expression: $2x - 3y + 4 - 3x - y - 2$

_____

_____ (3)

5.3   Calculate:

5.3.1 $4x + 3 - (3x - 2)$

_____

_____

_____   (4)

5.3.2 $\dfrac{18x^2 - 12x - 6}{6}$

_____

_____

_____   (3)

5.4   Complete the simplification steps below:

$2y \times 3y^2 - 14y \times y^2$

$= $ _____ $-$ _____

$= $ _____   (3)

[19]

QUESTION 6

6.1   Solve for x in each of the following equations.

6.1.1 $x - 10 = 2$

_____

_____   (2)

6.1.2 $2x + 1 = 203$

_____

_____

_____   (3)

6.1.3 $x^3 = 64$

_____

_____   (2)

6.2   Fill in the missing values for Question 6.2.1 and 6.2.2 in the flow diagram below.

x y

-3 ___   6.2.1   (1)

0 $y = -2x + 3$ 3

6.2.2   ___   5   (2)
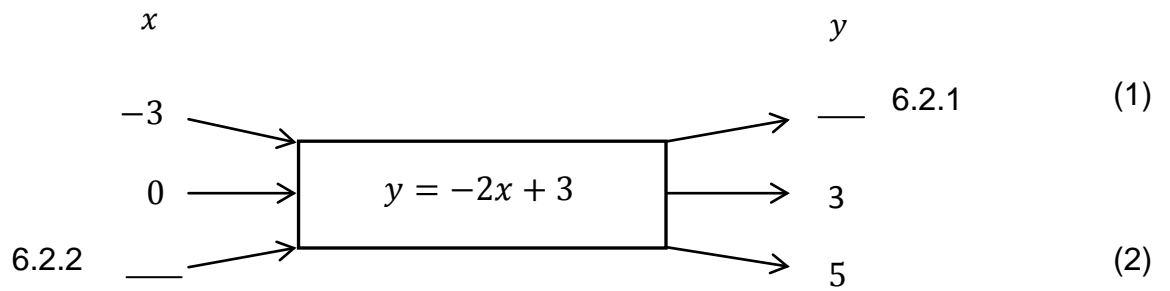
[10]

QUESTION 7

7.1   Choose the correct angle size from the list below only once to complete each statement.

| 60°   90°   180°   360° |

7.1.1   The sum of the interior angles of a triangle = _____   (1)

7.1.2   Each interior angle in an equilateral triangle = _____   (1)

7.1.3   The largest angle in a right-angled triangle = _____   (1)

7.1.4   The sum of the interior angles of any quadrilateral = _____   (1)

7.2   In $\triangle ABC$, $\hat{B} = 70°$ and $\hat{C} = 30°$. Calculate the size of $\hat{A}$.

_____

_____

_____
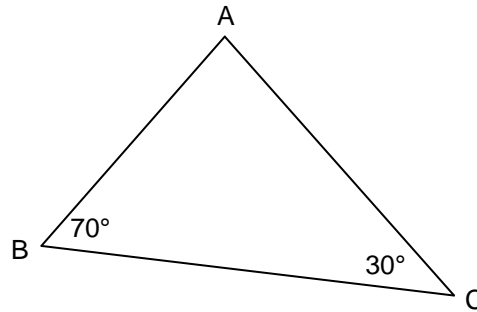
_____   (4)

7.3 In the diagram, $\widehat{A} = 40°$ and $\widehat{B} = 80°$. Calculate the size of $A\widehat{C}D$.
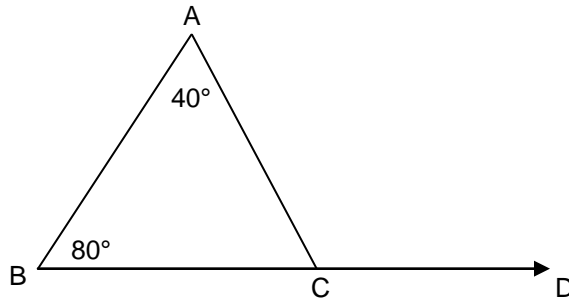
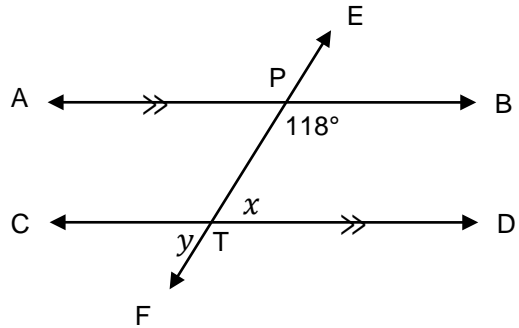| Statement	Reason
$A\widehat{C}D = 40° +$ _____	
$\therefore A\widehat{C}D =$ _____	

(3)

7.4 In the diagram below, ABC is a straight line. $\widehat{B}_2 = 75°$ and $\widehat{B}_3 = 55°$.

Determine the size of $\widehat{B}_1$.
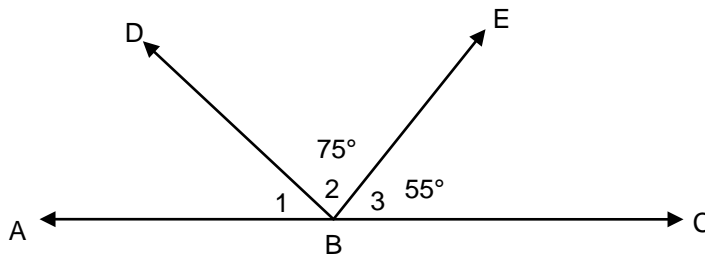
Statement	Reason
$\widehat{B}_1 + 75° + 55° =$ _____	sum of ∠s on a straight line
$\therefore \widehat{B}_1 =$ _____	

(2)

7.5   In the diagram below, $AB \parallel CD$ and $B\widehat{P}T = 118°$.

Calculate the value of x and y.

	Statement	Reason	
7.5.1	$x =$	co-interior ∠s and $AB \parallel CD$	(1)
7.5.2	$y =$		(2)

7.6   In the diagram, $DE = DH$, $EH \parallel FG$ and $D\hat{E}H = 75°$.
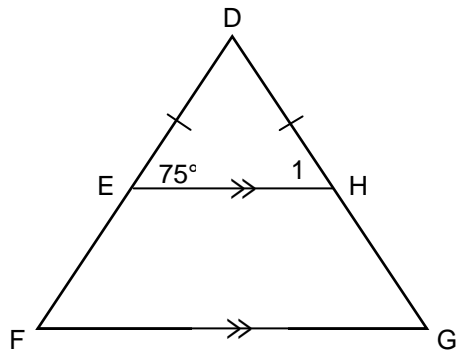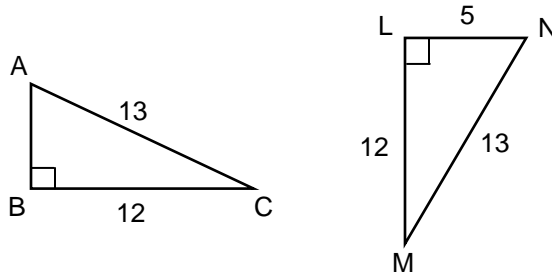

7.6.1   Calculate the size of $\hat{H}_1$

7.6.2   Give a reason why $\hat{G} = \hat{H}_1$.

	Statement	Reason
7.6.1	$\hat{H}_1 =$	∠s opp. equal sides of Δ (1)
7.6.2	$\hat{G} = \hat{H}_1$	(1)

[18]

QUESTION 8

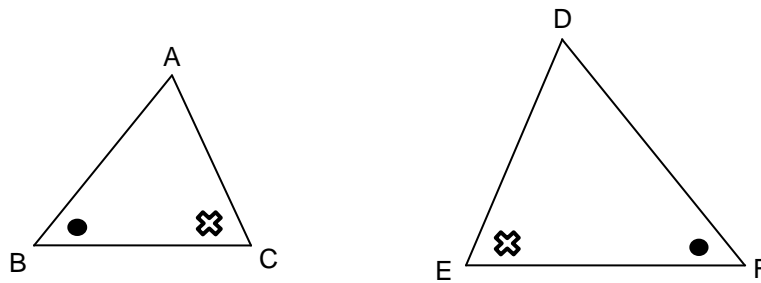8.1 Two right-angled triangles are given below. The dimensions are in cm.

Use the above triangles to complete the following statements:

8.1.1 $\triangle ABC \equiv \triangle$ _____ with the vertices written in the correct order. (1)

8.1.2 $AB =$ _____ (1)

8.1.3 $\hat{C} =$ _____ (1)

8.2 The acute-angled triangles ABC and DEF are given below.

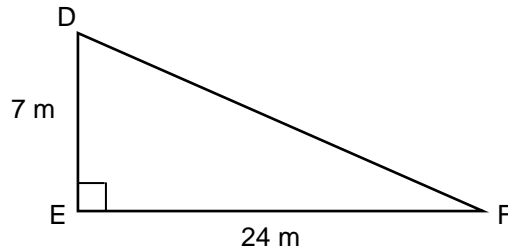Use the information given in the triangles to complete the following statements:

8.2.1 $\hat{C} =$ ____ (1)

8.2.2 $\hat{D} =$ ____ (1)

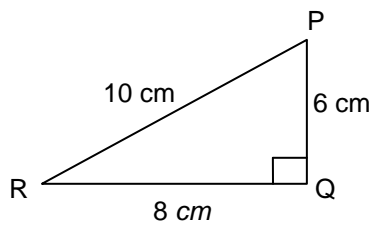8.2.3 Then $\triangle ABC$ ____ $\triangle DFE$ ($\angle\angle\angle$) (1)

QUESTION 9

9.1   In ΔDEF, $\hat{E} = 90°$, DE = 7 m and EF = 24 m. Use the Theorem of Pythagoras
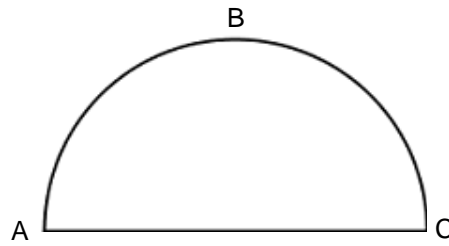   to calculate the length of DF.

_____

_____

_____

_____

_____   (4)

9.2   In ΔPQR, $\hat{Q} = 90°$, PQ = 6 cm, QR = 8 cm and PR = 10 cm.

       Calculate the area of ΔPQR.

_____

_____

_____   (3)

9.3   AC, the diameter of the given semi-circle ABC, is 20 cm.

Use $\pi = 3{,}14$ to calculate the perimeter of the figure correct to two decimal places. The formula for the circumference of a circle is $C = \pi d$ or $C = 2\pi r$.

_____

_____

_____

_____   (4)

9.4   Calculate the volume of a rectangular prism with length 2 m, breadth 1,5 m and height 0,5 m.

_____

_____

_____   (3)

[14]

QUESTION 10

The Mathematics test marks of a group of Grade 8 learners are given below.

54   66   92   70   50   81   84   36   78   58   58

10.1   Determine the median of the marks.

_____

_____   (2)

10.2   Write down the range.

_____   (1)

10.3   What is the modal mark?

_____   (1)

10.4   Calculate the mean of the marks, correct to two decimal places.

_____

_____   (2)

[6]

QUESTION 11

The difference between two natural numbers is 12 and their sum is 54.

Calculate the value of the larger number.

_____

_____

_____

_____

_____

_____

_____ (4)

[4]

TOTAL: 125