basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

MARKS	

ANNUAL NATIONAL ASSESSMENT 2014
GRADE 9 MATHEMATICS
TEST

MARKS: 140

TIME: $2\frac{1}{2}$ hours

PROVINCE _____

DISTRICT _____

SCHOOL NAME _____

EMIS NUMBER (9 digits)

CLASS (e.g. 9A) _____

SURNAME _____

NAME _____

GENDER (✓)

BOY		GIRL	

DATE OF BIRTH

C	C	Y	Y	M	M	D	D

This test consists of 21 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 – 12 in the spaces provided.
4. All working must be shown.
5. Give a reason for each of your statements in Question 9 and Question 10.
6. The test is out of 140 marks.
7. The test duration is $2\frac{1}{2}$ hours.
8. The teacher will lead you through the practice question before you start the test.
9. Approved scientific calculators (non-programmable and non-graphical) may be used except in Question 2.2 and Question 12.

Practice question

Circle the letter of the correct answer.

1. The next number in the sequence $3\ ;\ 6\ ;\ 11\ ;\ 18;\ \ldots$ is

   A 25

   B 24

   C 26

   D 27

You have done it correctly if you circled **(D)**.

The test starts on the next page.

QUESTION 1

1.1 $\sqrt{16x^{16}} = \ldots$

A $8x^8$

B $8x^4$

C $4x^4$

D $4x^8$

1.2 The LCM of $5a^3$ and $60a^2$ is …

A $60a^5$

B $30a^3$

C $60a^3$

D $300a^6$

1.3 The product of a number and 6 decreased by 4 is equal to 20. Which of the following equations matches the statement?

A $6x + 4 = 20$

B $6x - 4 = 20$

C $6(x + 4) = 20$

D $6 - 4x = 20$

1.4 The value of $-x^2 - 2(2x - 1)$ when $x = -2$ is …

A 6

B 1

C -6

D -1

1.5 What is the value of $(\frac{2}{3})^{-3}$?

A $\frac{-6}{9}$

B $\frac{5}{6}$

C $\frac{8}{27}$

D $\frac{27}{8}$

1.6 $(a + b)^0 =$

A $a + b$

B 2

C 1

D 0

1.7 What is the value of x if $3^x = \frac{1}{9}$?

A -3

B 3

C -2

D 2

1.8 $\frac{x}{y} - 1 =$

A $\frac{y-x}{x}$

B $\frac{y-x}{y}$

C $x - y$

D $\frac{x-y}{y}$

1.9 If 3 is a root of the equation $x^2 + x + t = 0$ the value of t is …

A 12

B -12

C $\frac{1}{12}$

D $-\frac{1}{12}$

1.10 If T is a point on the line defined by $y = x,$ the co-ordinates of T are …

A $(5\,;-5)$

B $(5\,;0)$

C $(-5\,;5)$

D $(-5\,;-5)$

[10]

QUESTION 2

2.1 Write $0{,}000\ 000\ 207\ mm^2$ in scientific notation.

(1)

2.2 Calculate without using a calculator. Show in each case all the calculation steps.

2.2.1 $\sqrt[3]{73-(-3)^2}$

(2)

2.2.2 Between which two consecutive integers does $\sqrt{110}$ lie?

(2)

2.2.3 $\dfrac{3\times 5^9}{5^7}$

(2)

2.3 Calculate leaving the answer in decimal form.

$1{,}03\times 10^{-2}+3{,}8\times 10^{-3}$

(2)

[9]

QUESTION 3

Simplify each of the following expressions. The denominators in the fractions are not equal to zero.

3.1 $2(x+2)^2-(2x-1)(x+2)$

(4)

3.2 $\dfrac{15x^2y^3+9x^2y^3}{8x^2y^3}$

(2)

3.3 $\dfrac{x^2-4x}{x^2-2x-8}$

(3)

3.4 $\frac{x^2}{2}+\frac{2x^2}{3}-\frac{7x^2}{6}$

(3)

3.5 $\frac{6x^2}{7xy}\times\frac{3y^3}{2x}$

(2)

[14]

QUESTION 4

Factorise fully:

4.1 $3x^2y-9xy^2+12x^3y^3$

(2)

4.2 $2(x+y)-t(x+y)$

(2)

4.3 $4x^2-y^2$

(2)

4.4 $x^2-11x+18$

(2)

[8]

QUESTION 5

Solve for x:

5.1 $(x-2)^2+3x-2=(x+3)^2$

(4)

5.2 $x^2-5x-6=0$

(2)

5.3 $\frac{x+2}{3}-\frac{x-3}{4}=0$

(3)

[9]

QUESTION 6

6.1 Complete the table below:

Position in pattern	1	2	3	4	5
Term	1	8	27		

(2)

6.2 Write down the general term T_n of the above number pattern.

_____ (1)

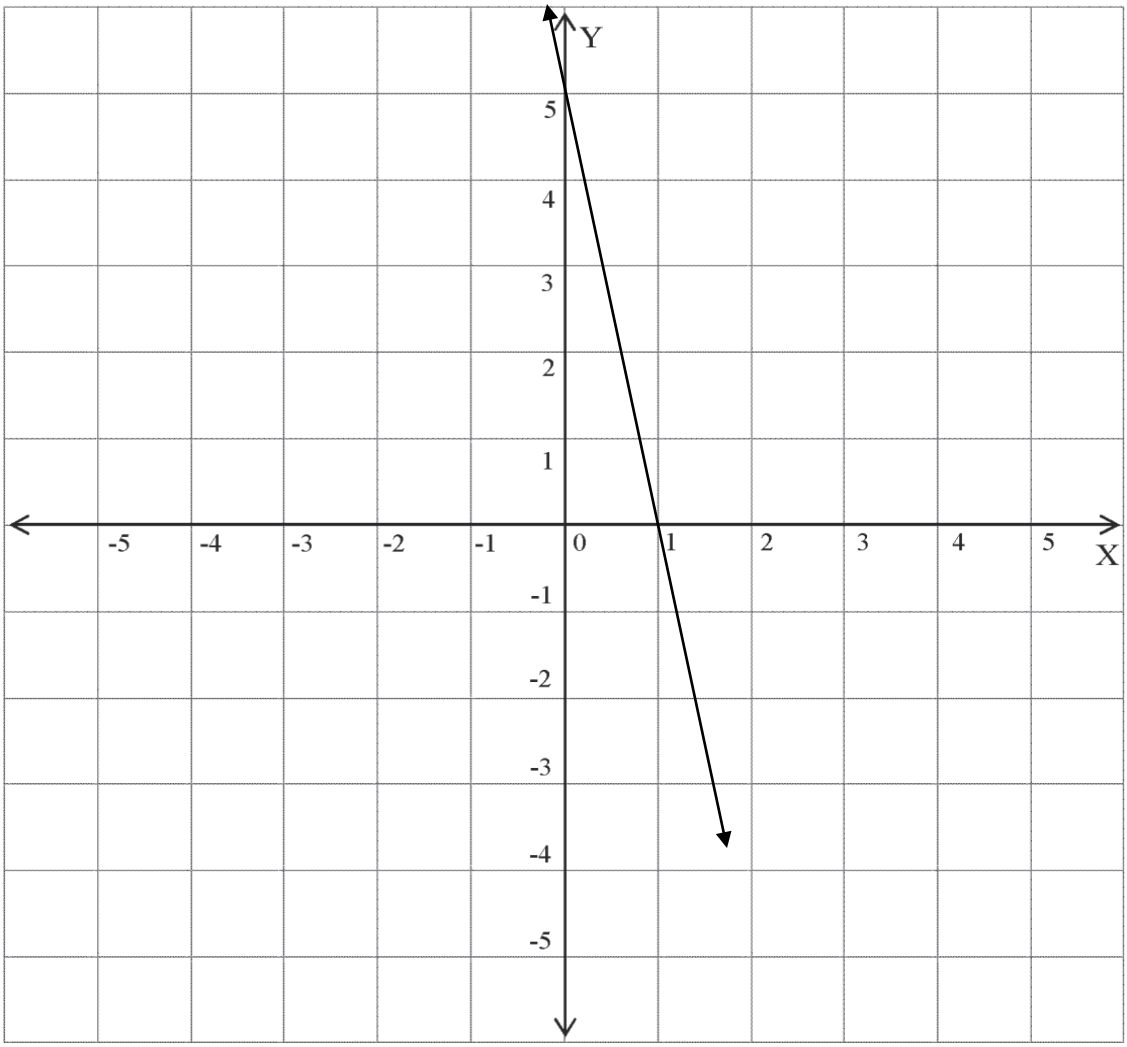
6.3 If $T_n = 512$, determine the value of n.

_____ (2)

[5]

QUESTION 7

Study the graph below.



7.1 Use the graph to calculate the gradient of the straight line.

(3)

7.2 Determine the equation of the straight line.

(2)

7.3 Write down the gradient of any other straight line which can be drawn parallel to the given line.

(1)

[6]

QUESTION 8

8.1 Decrease $240\ kg$ by 15%.

(2)

8.2 Nthabi's car uses 1 litre of fuel to travel $12\ km$. How much fuel will be needed to travel $420\ km$?

(2)

8.3 There are 44 boys and girls in Mary's class. The ratio of the number of boys to the number of girls is $5:6$. How many boys are there in Mary's class?

(3)

8.4 Study the table below.

The length of a side of a square in cm	2	3	4
Area of the square in cm^2	4	9	16

Is this an example of a direct or an indirect proportion? Give a reason for your answer.

(2)

8.5 Calculate how long it will take for an investment of $R4\ 000$ at 3% per annum simple interest to earn an interest of $R840$.

(6)

8.6 Calculate the final amount that I will have in my savings account if I invest $R600$ for 2 years at a rate of 6% per annum compound interest.

(4)

[19]

QUESTION 9

9.1 Complete each of the following statements:

9.1.1 $\hat{D}$ and $\hat{F}$ are complementary angles if _____. (1)

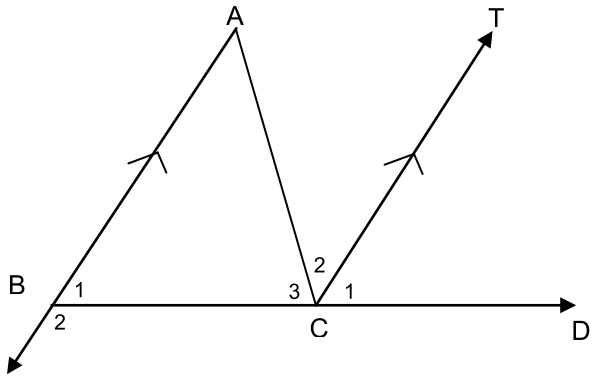
9.1.2 The sum of the interior angles of a triangle is equal to _____. (1)

9.1.3 The sum of the exterior angles of any polygon is equal to _____. (1)

9.1.4 A trapezium is a quadrilateral with one pair of _____sides. (1)

9.1.5 The diagonals of a rectangle are _____ in length. (1)

9.2

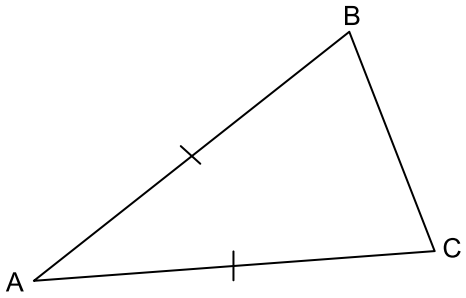


In the figure above, $AB \parallel TC$, $\hat{C}_1 = 65°$ and $\hat{C}_2 = 43°$. Calculate the size of $\hat{A}$, $\hat{B}_1$ and $\hat{B}_2$.

Statement	Reason

(3)

9.3



In ΔABC, $AB = AC$ and $\hat{C} = x°$. Determine the size of $\hat{A}$ in terms of x.

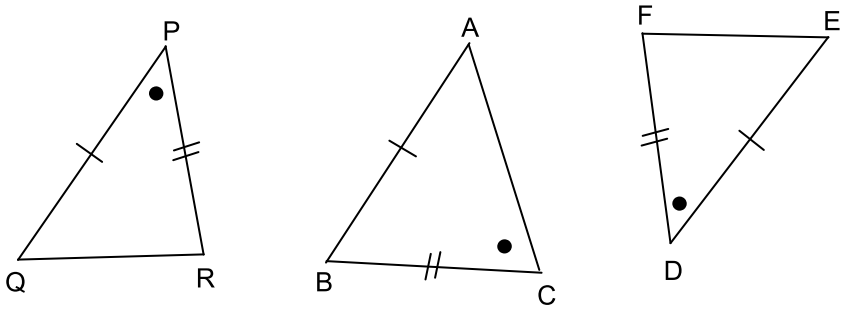
Statement	Reason

(3)

[11]

QUESTION 10

10.1

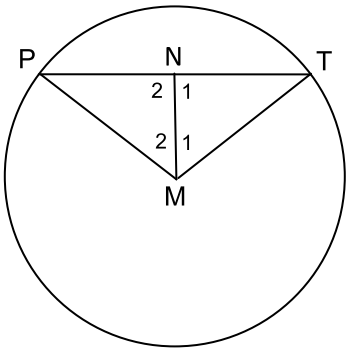


Which triangle is congruent to ΔPQR?

Statement	Reason

(2)

10.2 In the given figure, P and T are points on a circle with centre M. N is a point on a chord PT such that $MN \perp PT$.

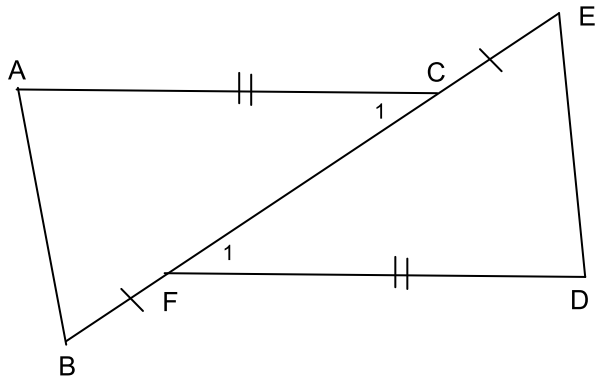


Prove that $PN = NT$.

Statement	Reason

(8)

10.3



In the above diagram, $AC = DF, AB = DE$ and $BF = CE$.

10.3.1 Prove that $BC = EF$.

Statement	Reason

(2)

10.3.2 Prove that $\Delta ABC \equiv \Delta DEF$.

Statement	Reason

(5)

10.3.3 Why is $\hat{B} = \hat{E}$?

Statement	Reason
$\hat{B} = \hat{E}$	

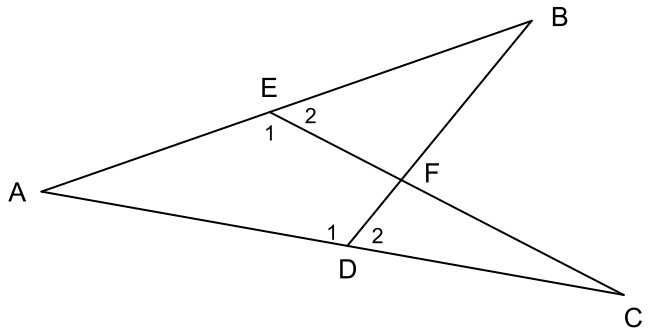
(1)

10.3.4 What is the relationship between AB and ED?

Statement	Reason

(2)

10.4



In the figure, $\hat{B} = \hat{C}$, $AD = 9\ cm$, $AE = 7\ cm$ and $CE = 21\ cm$.

10.4.1 Prove that $\Delta ABD \;|||\; \Delta ACE$.

Statement	Reason

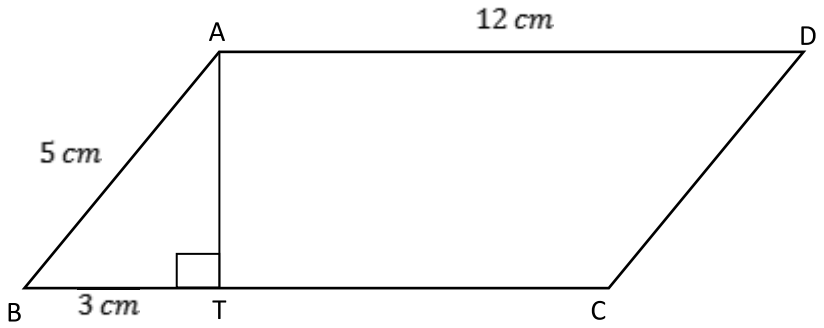
(6)

10.4.2 Calculate the length of BD.

Statement	Reason

(5)
[31]

QUESTION 11



In parallelogram $ABCD$, $AB = 5\ cm$, $AD = 12\ cm$, $BT = 3\ cm$ and $AT \perp BC$.

11.1 Calculate the length of AT.

(3)

11.2 Calculate

11.2.1 the perimeter of trapezium $ADCT$.

(1)

11.2.2 the area of trapezium $ADCT$.

(3)

11.3 The circumference of a circle is $52\ cm$. Calculate the area of the circle correct to 2 decimal places.

(4)

11.4 The length of a rectangle is doubled. Write down the value of k if the area of the enlarged rectangle $= k \times$ the area of the original rectangle.

(1)

[12]

QUESTION 12

Solve for x without using a calculator. Show the calculation steps.

12.1 $x = (\sqrt{8} + \sqrt{2})^2$

(3)

12.2 $\sqrt{\frac{1}{\sqrt{x}}} = 3$

(3)

[6]

TOTAL: 140