



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



ANNUAL NATIONAL ASSESSMENT 2015 GRADE 9 MATHEMATICS TEST

MARKS: 140

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

PROVINCE _____

DISTRICT _____

CIRCUIT _____

SCHOOL _____

EMIS NUMBER (9 digits)

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CLASS (e.g. 9A) _____

SURNAME _____

NAME _____

GENDER (✓)

BOY	
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GIRL	
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DATE OF BIRTH

C	C	Y	Y	M	M	D	D
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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 13 in the spaces provided.
4. All working must be shown.
5. The diagrams are not drawn to scale.
6. Give reasons for your statements in question 9, 10 and 11 when required.
7. The test is out of 140 marks.
8. The test duration is $2\frac{1}{2}$ 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 Which one of the decimal numbers is equal to $\frac{3}{5}$?

- A 0,8
- B 0,6
- C 0,53
- D 0,35

(1)

1.2 $\frac{4}{100} + \frac{3}{1\ 000} =$

- A 0,043
- B 0,1043
- C 0,403
- D 0,43

(1)

1.3 Which of these shows how 36 can be expressed as a product of prime factors?

- A 6×6
- B 4×9
- C $4 \times 3 \times 3$
- D $2 \times 2 \times 3 \times 3$

(1)

1.4 Between which 2 consecutive integers is the value of $\sqrt{61}$?

- A 6 and 7
- B 7 and 8
- C 8 and 9
- D 9 and 10

(1)

1.5 Which one shows the correct procedure for finding $\frac{1}{5} - \frac{1}{3}$?

A $\frac{1}{5} - \frac{1}{3} = \frac{1-1}{5-3}$

B $\frac{1}{5} - \frac{1}{3} = \frac{1}{5-3}$

C $\frac{1}{5} - \frac{1}{3} = \frac{5-3}{5 \times 3}$

D $\frac{1}{5} - \frac{1}{3} = \frac{3-5}{5 \times 3}$

(1)

1.6 Which of these number sentences is true?

A $\frac{3}{10}$ of 50 = 50% of 3

B 3% of 50 = 6% of 100

C $50 \div 30 = 30 \div 50$

D $\frac{3}{10} \times 50 = \frac{5}{10} \times 30$

(1)

1.7 A workman cuts off $\frac{1}{5}$ of a pipe. The piece he cut off was 3 metres long.

How many metres long was the original pipe?

A 8 m

B 12 m

C 15 m

D 18 m

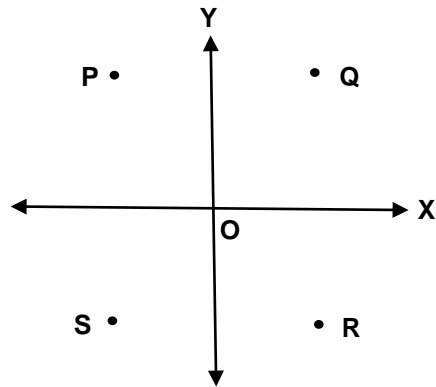
(1)

1.8 What does $xy + 1$ mean?

- A Add 1 to y , then multiply by x .
- B Multiply x and y by 1.
- C Add x to y , then add 1.
- D Multiply x by y , then add 1.

(1)

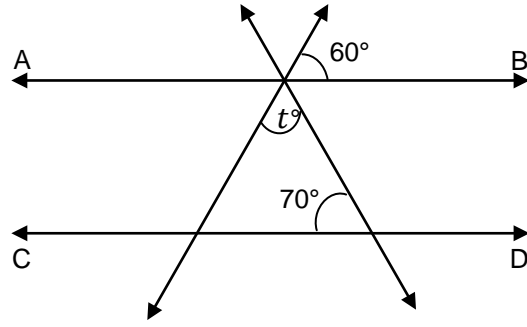
1.9 In the coordinate plane below, which point could have coordinates $(2; -4)$?



- A P
- B Q
- C R
- D S

(1)

1.10



Lines AB and CD are parallel. What is the value of t ?

- A 50
- B 60
- C 70
- D 40

(1)

[10]

QUESTION 2

2.1 Complete:

2.1.1 _____ is the smallest prime number. (1)

2.1.2 _____ is the LCM of 4, 8 and 12. (1)

2.2 Write down the HCF of 12 and 18.

(1)

2.3 Write 0,000 000 319 in scientific notation.

(2)

2.4 Show the calculation steps to calculate each of the following:

2.4.1 $2^3 \times 2^1$

(2)

2.4.2 $\frac{3^2 \times 5^4}{5^3}$

(2)

2.4.3 $2^{-2} + \left(\frac{1}{2}\right)^0$

(3)

[12]

QUESTION 3

3.1 Simplify each of the following expressions:

3.1.1 $3(x - 1) - 4(x - 2)$

(3)

3.1.2 $(x + 3)^2 + 4$

(4)

3.2 Simplify:

3.2.1 $\frac{5x^3 \times (2x)^2}{20x^4}$ if $x \neq 0$

(3)

3.2.2 $\frac{3x + 2}{2} + \frac{3 + x}{3} - \frac{7}{6}$

(4)

[14]

QUESTION 4

Factorise fully:

4.1 $x^2 - xy$

_____ (2)

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

_____ (2)

4.3 $x^2 - 81$

_____ (2)

4.4 $x^2 + 7x + 6$

_____ (2)

[8]

QUESTION 5

Solve for x :

5.1 $2x + 6 = 0$

(2)

5.2 $\frac{2x-1}{3} + x + 2 = 0$

(4)

5.3 $(x + 4)(x - 4) = 0$

(4)

5.4 $x^2 + x - 6 = 0$

(4)

[14]

QUESTION 6

6.1 Complete the following table:

x	1	2	3	4	6
y	-3	-5	-7	-9	

(1)

6.2 Write down the value of y in terms of x to describe the relationship between x and y in the above table.

$y =$ _____

(2)

6.3 Determine the value of x if $y = -51$ in the above table.

(3)

[6]

QUESTION 7

7.1 Use the equation $y = 2x - 1$ to calculate the values of y in the table below.

x	-1	0	3
y			

(3)

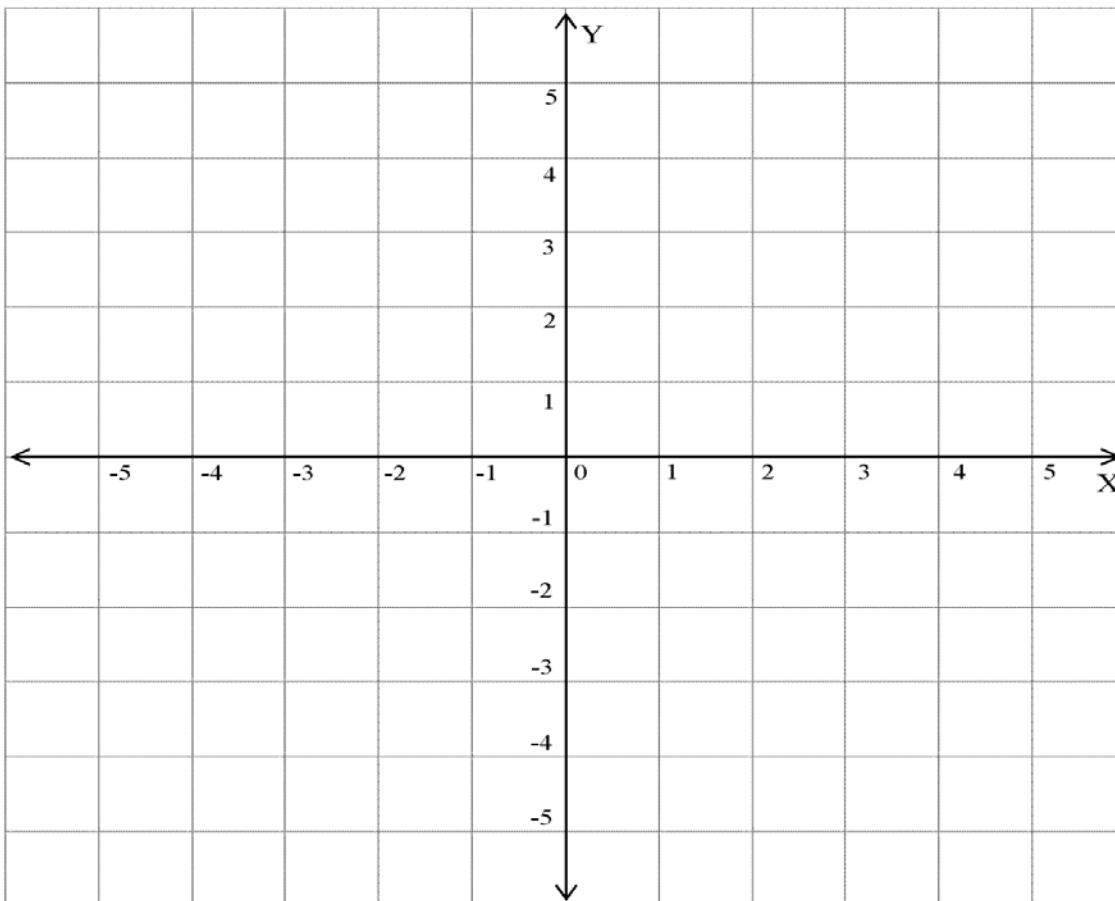
7.2 The points $A(-1; -2)$, $B(0;1)$ and $C(1;4)$ are given.

7.2.1 Plot the points A, B and C on the grid below.

(3)

7.2.2 Draw a straight line through the points A, B and C.

(1)



7.2.3 Calculate the gradient of the straight line through points A, B and C.

(3)

7.2.4 Determine the equation of a straight line that is parallel to the straight line through points A, B and C if it passes through the point (0; 4).

(3)

[13]

QUESTION 8

8.1 9 books cost R135. Calculate the cost of 15 of the same books.

(3)

8.2 Peter gets 48 out of 60 marks for a Mathematics test.
Calculate his percentage for the test.

(2)

8.3 Increase R1 200 by 20%.

(2)

8.4 Calculate the interest on an investment of R10 000 at 6,5% per annum compound interest for 3 years.

You may use the formula $A = P\left(1 + \frac{r}{100}\right)^n$ or $A = P(1 + i)^n$ or any other method.

(5)

[12]

QUESTION 9

9.1 Choose a word from the list below only once to complete each sentence.

congruent	similar	isosceles	obtuse-angled	right-angled
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9.1.1 In ΔABC , $AB = AC$. This means that $\hat{B} = \hat{C}$ and ΔABC is a/an _____ triangle.

(1)

9.1.2 In ΔABC , $\hat{A} = 40^\circ$ and $\hat{C} = 30^\circ$. This means that $\hat{B} = 110^\circ$ and ΔABC is a/an _____ triangle.

(1)

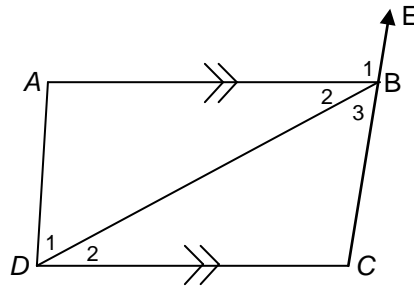
9.1.3 In ΔABC , $AB = 13$ cm, $AC = 5$ cm and $BC = 12$ cm. This means that ΔABC is a/an _____ triangle.

(1)

9.1.4 In ΔABC and ΔPQR , $\hat{A} = \hat{P}$ and $\hat{B} = \hat{Q}$. This means that the triangles are _____.

(1)

9.2 In the quadrilateral ABCD, $AB \parallel DC$.

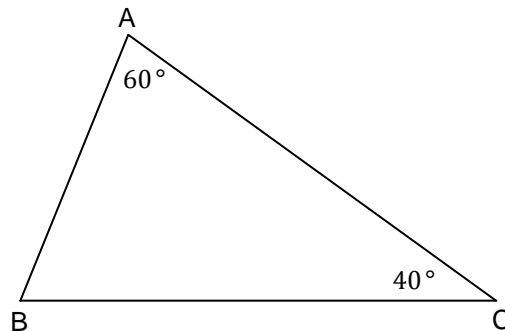


Complete the table below.

	Statement	Reason
9.2.1	$\hat{B}_1 = \underline{\hspace{2cm}}$	corr. \angle s and $AB \parallel DC$
9.2.2	$\hat{D}_2 = \underline{\hspace{2cm}}$	alt. \angle s and $AB \parallel DC$

(2)

9.3 In $\triangle ABC$, $\hat{A} = 60^\circ$ and $\hat{C} = 40^\circ$.

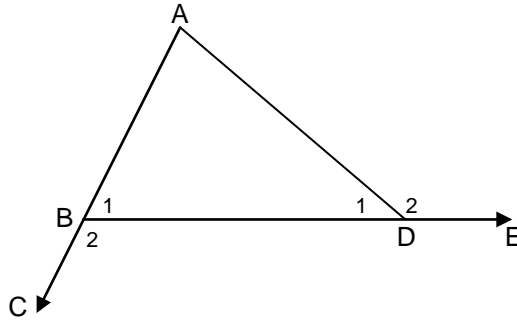


Complete the table to calculate the size of \hat{B} .

Statement	Reason
	sum of \angle s of \triangle

(2)

9.4 In the figure, $\widehat{B}_2 = 118^\circ$ and $\widehat{D}_2 = 126^\circ$.



Complete the table to calculate the size of \widehat{A} .

Statement	Reason
$\widehat{B}_1 = 180^\circ - 118^\circ = 62^\circ$	
$\widehat{B}_1 + \widehat{A} = \underline{\hspace{2cm}}^\circ$	

(5)

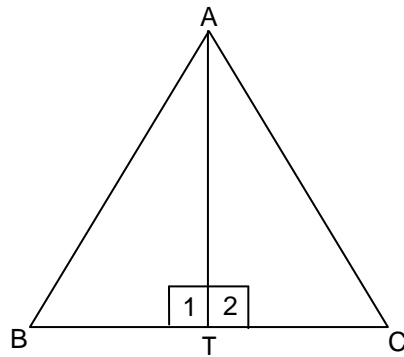
[13]

QUESTION 10

10.1 Write down the four conditions for two triangles to be congruent.

(4)

10.2 In $\triangle ABC$, $AT \perp BC$ and $BT = TC$.



Complete the table below to prove that $\triangle ABT \cong \triangle ACT$.

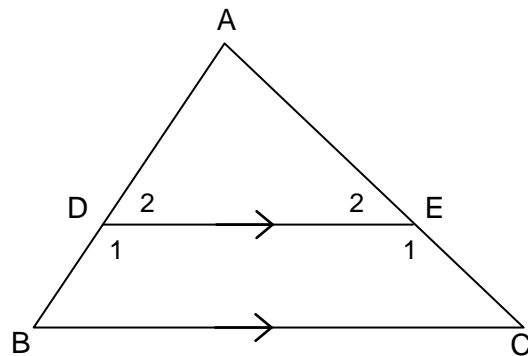
Statement	Reason
In $\triangle ABT$ and $\triangle ACT$:	
	given
	given $AT \perp BC$
	common
$\therefore \triangle ABT \cong \triangle ACT$	

(4)

[8]

QUESTION 11

11.1 In $\triangle ABC$ below $DE \parallel BC$.



Complete the table below to show that $\triangle ABC \sim \triangle ADE$.

Statement	Reason
In $\triangle ABC$ and $\triangle ADE$:	
11.1.1	
11.1.2	
11.1.3	
$\therefore \triangle ABC \sim \triangle ADE$	11.1.4

(7)

11.2 If $\triangle DEF \sim \triangle KLM$, $DE = 2,5 \text{ cm}$, $EF = 7 \text{ cm}$ and $KL = 5 \text{ cm}$, calculate the length of LM .

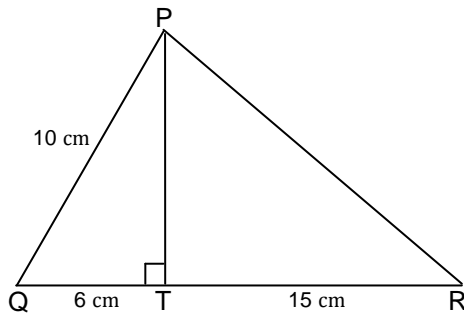
Statement	Reason
	proportional sides of similar triangles.

(5)

[12]

QUESTION 12

12.1 In $\triangle PQR$, $PT \perp QR$, $PQ = 10 \text{ cm}$, $QT = 6 \text{ cm}$ and $TR = 15 \text{ cm}$.



12.1.1 Calculate the length of PT .

(4)

12.1.2 Use the diagram in 12.1 to calculate the length of PR.

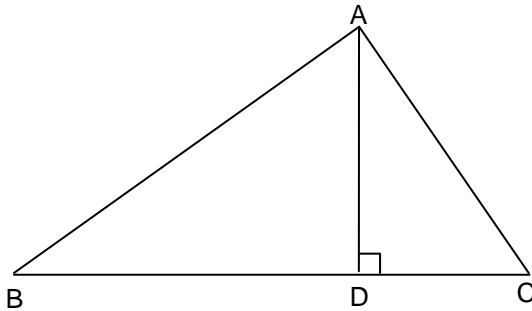
(4)

12.2 The area of a circle is equal to πr^2 .

Calculate the length of the radius of a circle of area = 120,7 cm². Write the answer correct to 2 decimal places.

(3)

12.3 In $\triangle ABC$, $AD \perp BC$, $BC = 24$ cm and $AD = 10$ cm.



12.3.1 Calculate the area of $\triangle ABC$.

(2)

12.3.2 How many times will the area of ΔABC in 12.3 be enlarged if $BC = 48$ cm and $AD = 20$ cm?

(1)

[14]

QUESTION 13

The perimeter of a rectangle is 46 cm. If the length = $(2x + 5)$ cm and the breadth = $(x + 6)$ cm, calculate the area of the rectangle.

(4)

[4]

TOTAL: 140

