



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

**NATIONAL
SENIOR CERTIFICATE**

GRADE 10

MATHEMATICS

COMMON TEST

MARCH 2019

MARKS: 75

TIME: 1½ hours

This question paper consists of 6 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 8 questions.
2. Answer ALL the questions.
3. Clearly show ALL calculations, diagrams, graphs, etc. which you have used in determining your answers.
4. Answers only will NOT necessarily be awarded full marks.
5. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
6. If necessary, round off answers correct to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. Write neatly and legibly.



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TO: THE CHIEF INVIGILATOR OF ALL SCHOOLS OFFERING
MATHEMATICS: GRADE 10

ERRATA

Please take note of the following change:

Page	ERROR	CORRECTION
Page 6 (Q 8.2)	In the diagram below $PQ = Q = MN$, QMP PN and ...	In the diagram below $PQ = QM = MN$, $QM // PN$ and ...

Kindly ensure that candidates are informed of the Errata.

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ASSISTANT DIRECTOR
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4/3/2019
DATE

...Championing Quality Education-Creating and Securing a Brighter Future

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QUESTION 1

1.1 Factorise the following expressions fully:

1.1.1 $6x^2 + 7x - 20$ (2)

1.1.2 $x^3 + x^2 - x - 1$ (3)

1.2 Simplify the following expressions fully:

1.2.1 $(2x + 3)(5 - x)$ (3)

1.2.2 $(xy^3 - 3)(x^2y^6 + 3xy^3 + 9)$ (2)

1.2.3 $\frac{3^{2x-1} \cdot 5^{x-3}}{45^{x-2}}$ (4)

[14]**QUESTION 2**Determine, without the use of a calculator, the value of x in each of the following:

2.1 $(x - 3)(x + 2) = 0$ (2)

2.2 $11 \times 3^{2x+1} = 297$ (3)

2.3 $\frac{4x^2 - 3x - 1}{4x + 1} + \frac{x^3 + 1}{x^2 - x + 1} = 2$ (5)

2.4 $\pi x^2 h = V$ (2)

[12]**QUESTION 3**

3.1 Rewrite 0,45 as a common fraction, in simplest form. (1)

3.2 Given: $P = \sqrt{\frac{-20x}{1-3x}}$; where $x \in R$ 3.2.1 For which value(s) of x is P undefined? (2)3.2.2 If $x = 7$, determine between which two integers P lies. (2)3.3 The larger of two consecutive integers is represented by $x + 3$. Determine an expression which represents the smaller integer. (1)**[6]**

QUESTION 4

4.1 Solve for x and y simultaneously:

$$4x = 10 - 3y \quad (5)$$

$$y + 2x = 6$$

4.2 The following inequality is given: $-9 \leq 2x + 3 < 5$; where $x \in R$

4.2.1 Solve for x in the inequality. (3)

4.2.2 Represent your answer to QUESTION 4.2.1 on a number line. (1)

4.2.3 Write your answer to QUESTION 4.2.1 in interval notation. (1)

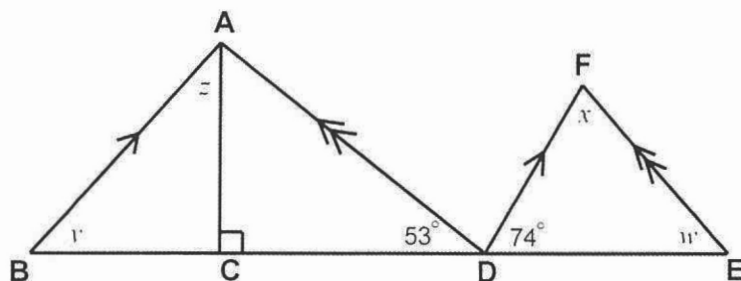
4.3 The mean of three numbers is 25. The second number is four less than twice the first. The third number is two more than four times the first.

(Hint: Let the smallest number be x)

Calculate the numerical value of the smallest number. (4)
[14]

QUESTION 5

Study the diagram below and calculate the unknown angles w , x , y and z .
Give reasons for your statements.



[4]

QUESTION 6

6.1 Complete the following statements:

6.1.1 A quadrilateral with two pairs of adjacent sides equal is a (1)

6.1.2 A quadrilateral with both pairs of opposite sides parallel is a (1)

6.2 Which quadrilateral has diagonals that always bisect its angles and also bisect each other? (1)

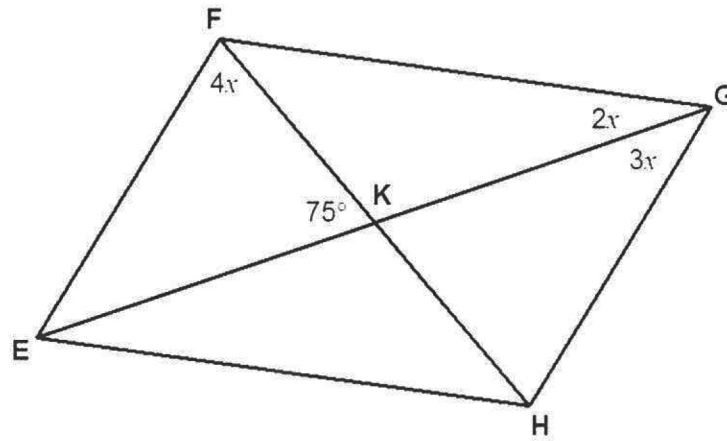
6.3 Given the following three quadrilaterals: a rectangle, a rhombus and a kite.

Which of these quadrilaterals do not have perpendicular diagonals? (1)
[4]

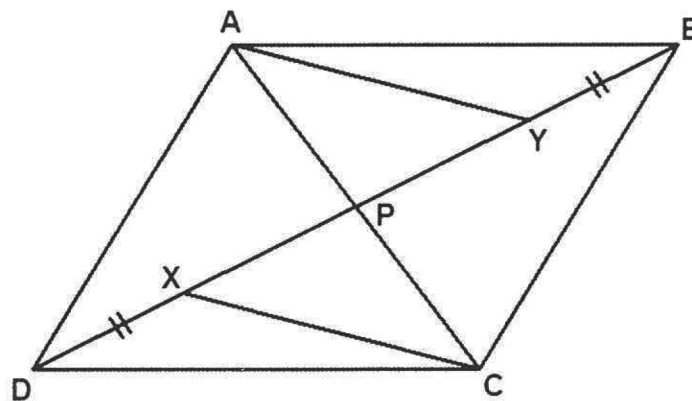
Give reasons for your statements in QUESTIONS 7 and 8.

QUESTION 7

- 7.1 In the sketch below, EFGH is a parallelogram.
 $\hat{FKE} = 75^\circ$; $\hat{EFK} = 4x$; $\hat{FGK} = 2x$ and $\hat{KGH} = 3x$.



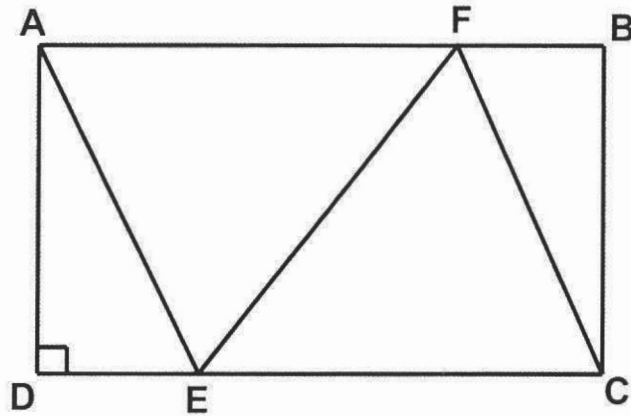
- 7.1.1 Calculate the value of x . (3)
- 7.1.2 Calculate the size of \hat{GHE} . (2)
- 7.2 In the diagram ABCD is a parallelogram with diagonals intersecting at P.
 AY and CX are drawn such that $BY = DX$.



- Prove that AYCX is a parallelogram. (3)
- [8]

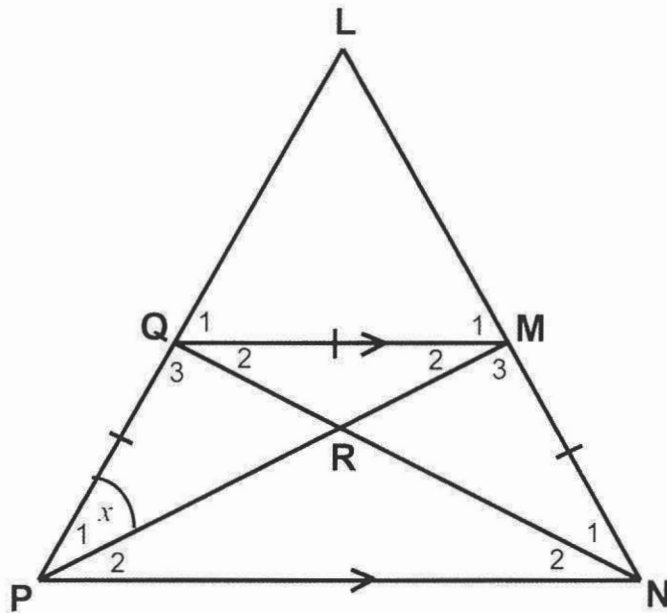
QUESTION 8

8.1 The sketch below shows rectangle $ABCD$ with points F and E drawn such that $AFCE$ is a rhombus.



If it is further given that $AB = 16\text{cm}$ and $BC = 12\text{cm}$, calculate the length of CF . (7)

8.2 In the diagram below $PQ = QM = MN$, $QM \parallel PN$ and $\hat{LPN} = \hat{LNP}$.



8.2.1 Show that MP bisects \hat{P} . (Hint: let $\hat{P}_1 = x$) (3)

8.2.2 Prove that $\triangle PRN \parallel \triangle QRM$. (3)

[13]

TOTAL: 75