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MARITZBURG COLLEGE

JUNE 2017

EXAMINATIONS

GRADE 9

MATHEMATICS

MARKS: 120

TIME: 2 HOURS

This question paper consists of 7 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Write your name and teacher's name on your answer booklet.
2. This question paper consists of 9 questions.
3. Answer ALL the questions.
4. Clearly show ALL calculations, diagrams, graphs et cetera that you have used in determining your answers.
5. Answers only will not necessarily be awarded full marks.
6. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
7. If necessary, round answers off to TWO decimal places, unless stated otherwise.
8. Diagrams are NOT necessarily drawn to scale.
9. Number the answers correctly according to the numbering system used in this question paper.
10. Write legibly and present your work neatly.

QUESTION 1

Write the letter only of the most correct answer, e.g. 1.1 C

1.1 $-3^4 =$

A: 81 B: -81 C: -12 D: 12

1.2 Given the expression $-3x^2 + \frac{c}{2} - x + 5$, what is the coefficient of x^2?

A: 2 B: -1 C: -3 D: $\frac{c}{2}$

1.3 If $y = 2x^2 - 1$, give the value of y when $x = -2$?

A: 5 B: 9 C: 7 D: 8

1.4 $\frac{3}{y} + 5 =$

A: $3y + 5$ B: $\frac{3+5y}{y}$ C: $\frac{8}{y}$ D: $\frac{15}{y}$

[4]

QUESTION 2

Show any necessary working

Simplify, leaving answers with positive exponents:

2.1 $-2a^2b \times 8a^3b^2$ (3)

2.2 $4 + 2x^3 - 3x + 2 + 3x - x^3$ (2)

2.3 $(x^2y^3)^5$ (2)

2.4 $\sqrt{16a^{16}}$ (2)

2.5 $\left(\frac{x}{2}\right)^{-3}$ (3)

2.6 $3^0 + 2^0.3^{-1} - \frac{1}{3^{-1}}$ (3)

2.7 $\frac{14a+2}{4}$ (2)

2.8 $\frac{x^2-4}{4} \times \frac{x+1}{x^2-x-2} \times \frac{2x-4}{x+2}$ (4)

2.9 $\frac{4x}{2} - \frac{2x+1}{4} + \frac{3-x}{3}$ (5)

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QUESTION 3

3.1 Given: $3x^3 - 2x^2 + 4 - 11x$

3.1.1 Classify the polynomial (1)

3.1.2 What is the constant term? (1)

3.1.3 What is the degree of the polynomial? (1)

3.1.4 Arrange the expression in ascending powers of x. (1)

3.1.5 Find the value of the expression if $x = -3$ (2)

3.1.6 Subtract $2x^2 - 4x - 8$ from the above expression. (3)

[9]

QUESTION 4

Factorise the following completely**:**

4.1 $2a^3b^2c^5 + 8a^2b^3c$ (2)

4.2 $9x^2 - 4$ (2)

4.3 $a^2 - 6a - 16$ (2)

4.4 $a^4 - \frac{81}{16}$ (4)

4.5 $4x^2(y-1) - 25(y-1)$ (4)

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QUESTION 5

5.1 Solve for x:

5.1.1 $\frac{x}{4} = 0$ (1)

5.1.2 $3(x + 4) = 15$ (3)

5.1.3 $\frac{x+1}{4} - 1 = 2x$ (4)

5.1.4 $2^x = 32$ (1)

5.1.5 $x^2 - 4 = 0$ (3)

5.1.6 $2x - 1 \leq 3x - 5$ (2)

5.2 A toasted cheese sandwich costs twice as much as a doughnut at the tuck shop.
Two toasted cheese sandwiches and three doughnuts cost R35,00.
Form an equation and solve it to determine what one doughnut costs. (3)

[17]

QUESTION 6

6.1 Say whether the following are true or false:

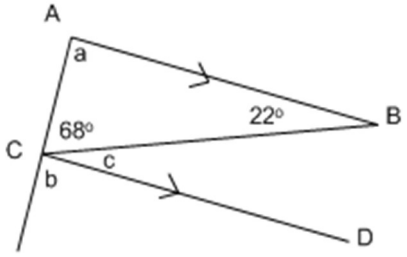
6.1.1 When all three angles in a triangle are equal the triangle is an isosceles triangle. (1)

6.1.2 The angles of a square add up to 380^0 (1)

6.1.3 A square is also a rectangle. (1)

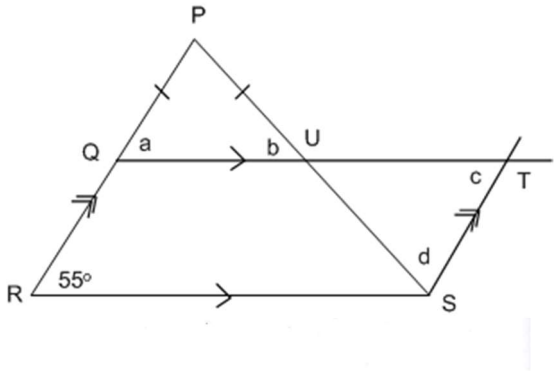
6.2 Find the values of the variables in these diagrams with reasons:

6.2.1 Solve for $a, b \text{ and } c$: with reasons



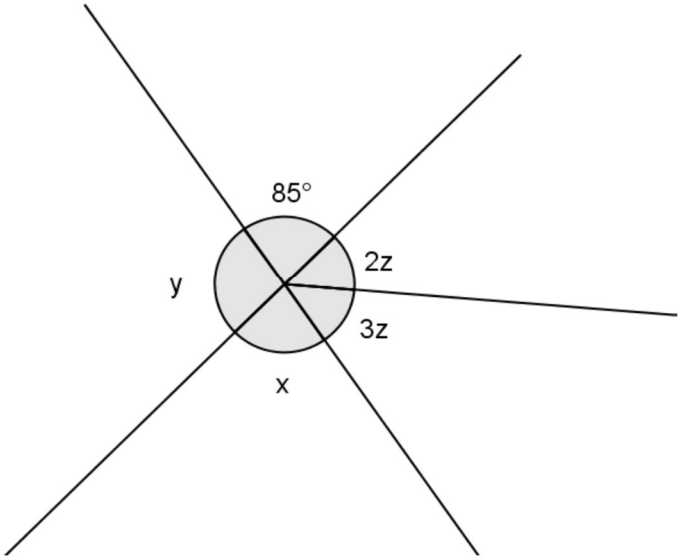
(6)

6.2.2 Solve for $a, b, c \text{ and } d$:



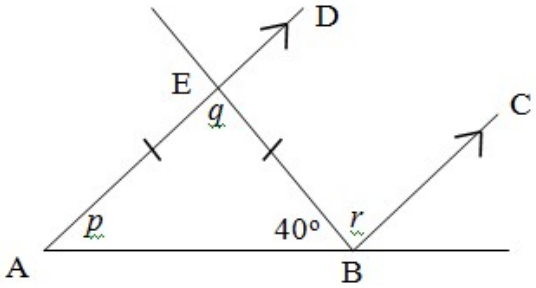
(10)

6.3 Calculate x, y and z, with reasons:



(7)

6.4 Solve for p,q and r:



(6)

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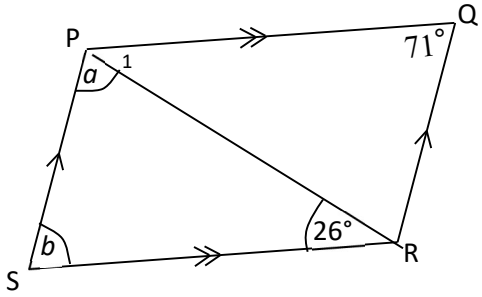
QUESTION 7

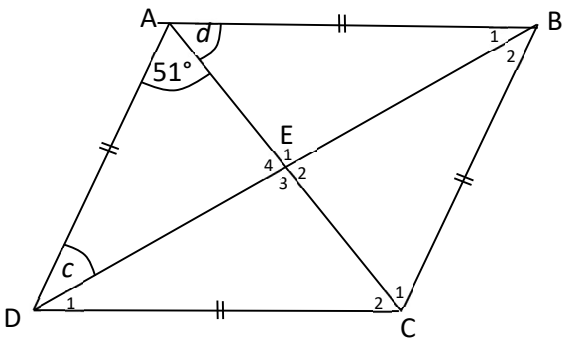
Calculate for the variables a to d, with reasons:

7.1



(4)

7.2

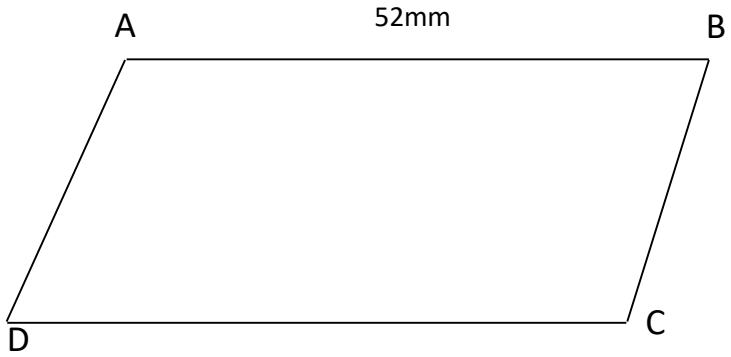


(6)

QUESTION 8

$ABCD$ is a parallelogram.

$AB = 52mm, \hat{A} = 2x - 20^0; \hat{C} = x + 40^0.$



Find, giving reasons:

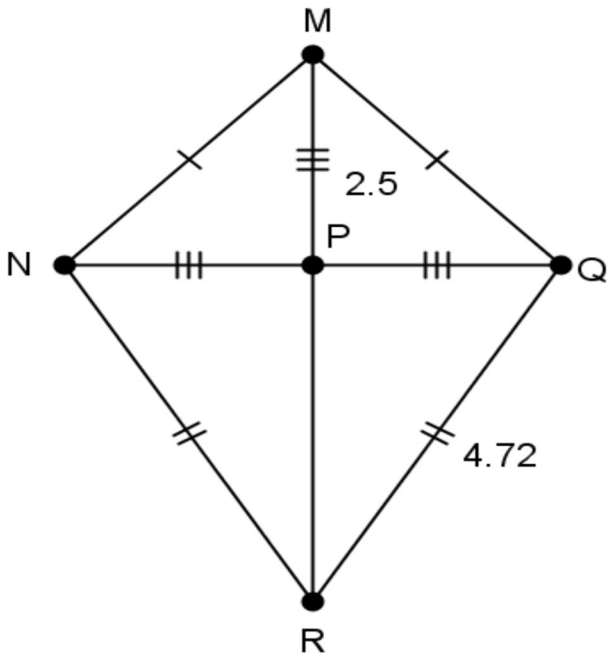
8.1 the length of DC . (2)

8.2 the size of $\hat{C}$. (2)

[4]

QUESTION 9

$MNQR$ is a kite with MP=2,5 and QR=4,72.



9.2.1. Find the length of MQ and MN. (2)

9.2.2. Find the length of PR. (2)

[4]