MARITZBURG COLLEGE

EST. 1863

NOVEMBER EXAMINATIONS

GRADE 9 MATHEMATICS

EXAMINER: L. MOFFATT **MARKS: 120**

MODERATOR: F. DEYZEL **TIME: 2 HOURS**

Instructions to the learner

1. Write your name and your **Maths Teacher's** name on your script.
2. Question 1 consists of 10 multiple-choice questions. Write only the letter of the correct answer next to the question number.
3. All working must be shown from Question 2 onwards.
4. You may assume all lines are straight.
5. Approved scientific calculators may be used unless stated otherwise in the question.

Question 1

1.1 $\sqrt[3]{27x^3}$

a) $3x^3$
b) $3x^2$
c) $9x^9$
d) $3x$

1.2 Which one of the following numbers has the same value as $5^6 \times 5^{-2}$?

a) 5^{-12}
b) 5^{-3}
c) 5^4
d) 5^8

1.3 How many terms are there in the expression? $\frac{-x^3 - x + 2}{x-1} + \frac{3}{x-2}$

a) 4
b) 1
c) 8
d) 2

1.4. Complete: $\sqrt{10^2 - 8^2}$

a) 4
b) 36
c) 6
d) 60

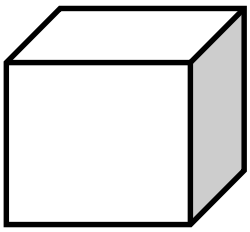
1.5. What does $xy + 1$ mean?

a) Add 1 to y then multiply by x
b) Multiply x and y by 1.
c) Add x to y, and then add 1.
d) Multiply x by y, and then add 1.

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

a) (5; -5)
b) (5; 0)
c) (-5; -5)
d) (-5; 5)

1.7. The volume of a cube below whose height is 4cm is ……



a) 8 cm^3
b) 16 cm^3
c) 32 cm^3
d) 64 cm^3

1.8. In ΔABC, $\hat{B}$ =50 ° and $\hat{C}$ = 80 °. What is the size of $\hat{A}$?

a) 130°
b) 50°
c) 100°
d) 150°

1.9. The equation of the straight line with a gradient of 3 and y- intercept of -2 is:

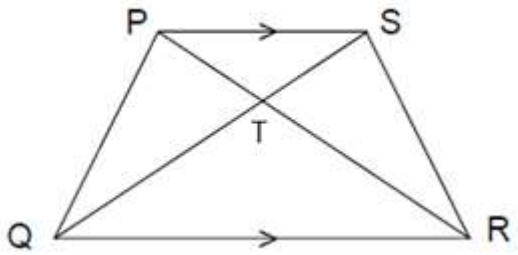
a) $y = 3x + 2$

b) $y = 3x - 2$

c) $3y = x - 2$

d) $y = \frac{3}{2}x - 2$

1.10. In the figure below PS//QR.
Which ONE of the following statements is true for this figure?



a) $\Delta PTS \equiv \Delta PQT$
b) $\Delta PTS \equiv \Delta RTQ$
c) $\Delta PTS \,|||\, \Delta SRT$
d) $\Delta PTS \,|||\, \Delta RTQ$ **[10]**

Question 2

2.1 Calculate 12 ½ % of R3580. (1)

2.2 The price of a car is R80 000 and is increased by 15%. What is the new price? (2)

2.3 The price of a television set is R10 500 and is reduced by 10%. What is the discounted price? (2)

2.4 Calculate the simple interest on R3500 invested at 6% per annum for 3 years. (2)

2.5 Calculate how long it will take for an investment of R4000 at 3% per annum simple interest to earn an interest of R840.00 (3)

[10]

Question 3

Simplify and give the answers with positive exponents:

3.1 $3a^4 \times 4a^8$ (2)

3.2 $\dfrac{6x^2 \times 8xy^3}{12x^4y^2}$ (3)

3.3 $2^{-2} + \left(\dfrac{1}{2}\right)^0$ (2)

[7]

Question 4

Observe the expression $3x + 6x^4 - 2x^5 + 4x^0 - x^3$

4.1 Is this expression a polynomial? (1)

4.2 Write down the coefficient of x^3. (1)

4.3 Calculate the value of the expression when $x = -1$ (3)

4.4 Write the degree of the expression. (1)

[6]

Question 5

5.1 Subtract $-2a^3 + 2a^2 - 4a$ from $a^3 - 3a^2 + a$. (3)

5.2 Simplify each of the following expressions:

5.2.1. $3(x-1) - 4(x-2)$ (3)

5.2.2. $(x+3)^2 + 4$ (4)

5.2.3. $\dfrac{2x+1}{4} - \dfrac{x+2}{2} - \dfrac{1}{4}$ (4)

[14]

Question 6

Factorise completely:

6.1 $6a^3 - 12a^2$ (2)

6.2 $2(x+y)+t(x+y)$ (2)

6.3 $7x^2 - 28$ (3)

6.4 $x^2 + 7x + 6$ (2)

[9]

Question 7

Solve for x

7.1 $2x + 6 = 0$ (2)

7.2 $5x - 4 = 2x + 8$ (3)

7.3 $\frac{x}{3} - 3 = 2$ (3)

7.4 $3(x+3) = 2(2x-3)$ (4)

[12]

Question 8

A diagram sheet is attached to your answer booklet, please do question 8.1 and 8.2 on that grid.

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

8.1 Plot the points A, B and C on the grid on the diagram sheet and label each point clearly. (3)

8.2 Draw a straight line through points A, B and C. (1)

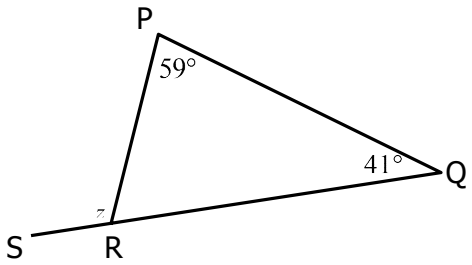
8.3 Calculate the gradient of the straight line through points A, B and C. (3)

8.4 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)

[10]

Question 9

9.1 In ΔPQR, $\hat{P} = 59°$ and $\hat{Q} = 41°$

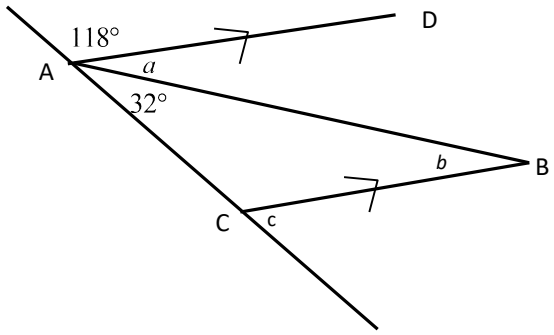


Copy and complete the table to calculate the size of $\hat{z}$. **DO NOT** do it on this question paper.

Statement	Reason

(2)

9.2

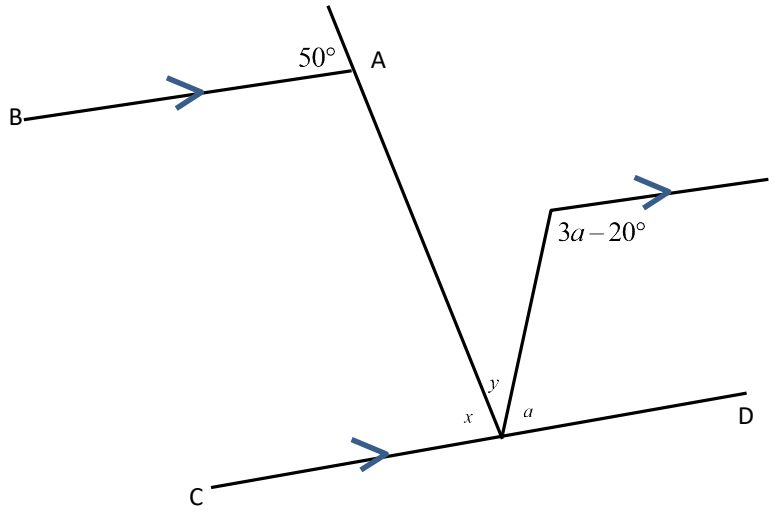


In the figure above, AD// CB, calculate the size of *a*, *b* and *c*. You may use the table to help you set it out on your exam paper, **DO NOT** do it on the question paper.

Statement	Reason
$a =$	
$b =$	
$c =$	

(6)

9.3



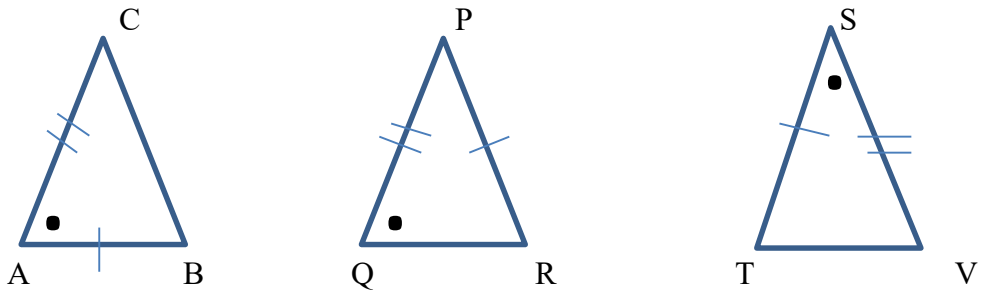
In the figure above calculate and give reasons for the sizes of x, y and a

(6)

[14]

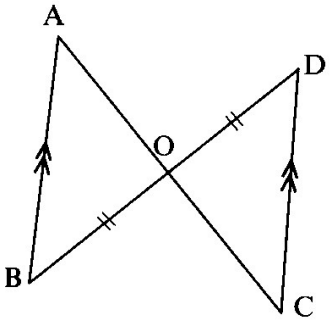
QUESTION 10

10.1 State which triangle is congruent to ΔABC and give the reason.



(2)

10.2 It is given that AB//DC and BO = OD. Prove that $\Delta ABO \equiv \Delta DCO$



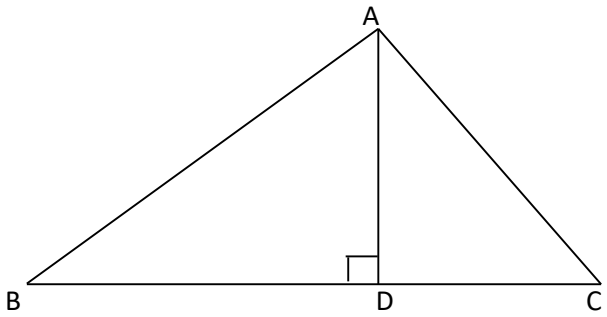
(4)

[6]

QUESTION 11

$A = l \times b$	$A = l^2$	$A = \pi r^2$	$A = \frac{1}{2} b \times h$
$P = 2l + 2b$	$P = 4 \times l$	$C = \text{diameter} \times \pi$ $= 2\pi \text{r}$	$P = \text{side} + \text{side} + \text{side}$

11.1 In Δ ABC, AD $\perp$ BC, BC = 24cm and AD =10cm.



11.1.1 Calculate the area of Δ ABC. (2)

11.1.2 How many times will the area of Δ ABC in 11.1 be enlarged if

BC = 48cm and AD = 20cm? (1)

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

(4)

[7]

Question 12

Data set

70	69	73	69	66	69	74	78
64	67	65	71	68	73	62	

The Data set represents the weight, to the nearest kg, of a group of learners in a school.

12.1 Draw a stem and leaf diagram for the data. (3)

12.2 Calculate the range of Data set (1)

12.3 What is the mode of Data set ? (1)

12.4 Find the median of Data set. (2)

12.5 Calculate the mean weight for the school. (2)

[9]

Question 13

13.1 There are 3 green and 2 red balls in a bag. Two balls are being drawn without replacing it.

Determine the probability that the first ball drawn will be:

13.1.1 green (2)

13.1.2 red. (2)

13.2 A box contains 3 blue, 4 white and 5 green marbles of the same size.

13.2.1 If you take out 1 marble, what is the probability that you will take out a green marble? (1)

13.2.2 If you draw a white marble first and do not replace it, what is the probability of taking out another white marble? (1)

[6]