June Exam

Grade 8 Mathematics

Marks: 150

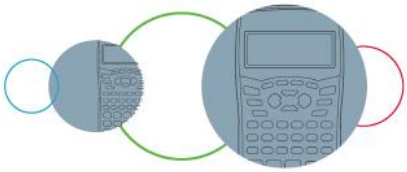
Time: 2 hours

Instructions:

Read the following instructions carefully before answering the questions:

1. This question paper consists of 7 pages.
2. Answer ALL the questions.
3. Clearly show ALL calculations, diagrams, graphs, et cetera that 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 to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. Number the answers correctly according to the numbering system used in this question paper.
9. Write neatly and legibly.

Good Luck



Question 1

1.1. Given the list of numbers below:

25; 78; 23; -7; $\sqrt{-2}$; $\frac{0}{5}$; $\frac{8}{0}$; 36; -64; 51;

1.1.1. Which numbers in the list are integers? (2)

1.1.2. Which numbers in the list are non-real? (2)

1.1.3. Which numbers in the list are a perfect square? (1)

1.1.4. Which numbers in the list are a perfect cube? (1)

1.1.5. Which numbers in the list are prime numbers? (2)

1.2. Give the factors for each of these numbers:

1.2.1. 84 (2)

1.2.2. 54 (2)

1.3. Using prime factors find the lowest common multiple and the highest common factor for each set of numbers given:

1.3.1. 98 and 70 (2)

1.3.2. 72 and 120 (2)

[16]

Question 2

Without using your calculator find the answers for the following:

2.1. $\sqrt{0.36}$ (2)

2.2. $(-8)^2 \div -4$ (2)

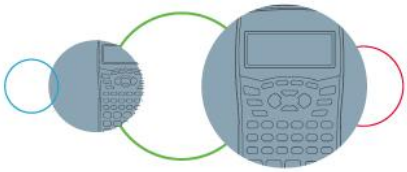
2.3. $(-4) + (-4) - (-8)$ (2)

2.4. $5 \times \frac{-42}{6} + (-12)$ (3)

2.5. $\sqrt[3]{-3\frac{3}{8}}$ (2)

2.6. $2 - 16 + 3 \times -2$ (2)

[13]



Question 3

3.1. Write the following in exponential form:

3.1.1. 3 x 3 x 3 x 2 x 2 x 2 x 2 (2)

3.1.2. a x a x b x b x b x b (2)

3.2. Write the following numbers in correct scientific notation

3.2.1. 464 000 (1) 3.2.2. 0.332 (1)

3.3. Write the following numbers in scientific notation into normal notation

3.3.1. 4.92×10^3 (1) 3.3.2. 7.22×10^8 (1)

3.4. Simplify the following using your exponential laws

3.4.1. $\frac{(a^4b)^0}{ab^8} \times \frac{cb^2}{a^5c^2}$ (3) 3.4.2. $\frac{(x^2y)^{-1}}{(xy^2z)^3} \div \frac{2x^3y^{-7}}{4x^4y^8} \times \frac{6xy}{z^3}$ (4)

3.5. Solve for x: $3^x + 1 = 10$ (3)

[18]

Question 4

4. For each of the given patterns:

i) Find the next three terms

ii) Give the rule in words

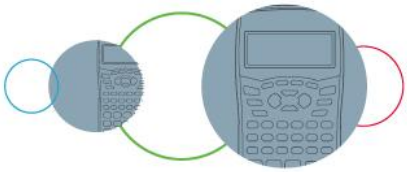
iii) Find the 20th term in the pattern.

4.1. 20, 26, 32, 38… (3)

4.2. 3, 6, 12, 24… (3)

4.3. 8, 10, 13, 17, 23… (3)

[9]



Question 5

Sipho works at a juice bar. He earns R35 an hour.

5.1. Redraw the table below on your answer sheet and fill in the missing values:

Number of Hours Worked	1	2	3	7	10	?	?
Amount Earned	35	70	?	?	?	490	700

(5)

5.2. Write down a formula to represent how much money Sipho earns (M) if he works n hours. (1)

[6]

Question 6

6.1. Given the polynomial: $7x^6 - 8x^4 + 2x^3 - 3x + 10$

6.1.1. What is the degree of the polynomial? (1)

6.1.2. Give the coefficient of x^4. (1)

6.1.3. How many terms are in the polynomial? (1)

6.1.4. What is the constant? (1)

6.2. Simplify the following

6.2.1. $3x(4x + y)$ (2)

6.2.2. $-y(8y - 2)$ (2)

6.2.3. $-4xy(4x^2 + 7y - 8xy)$ (3)

6.2.4. $12a(4a + b) - 6b(7a - 3)$ (4)

6.2.5. $(3x^3 - 27x^2 + 6xy) \div 3x$ (3)

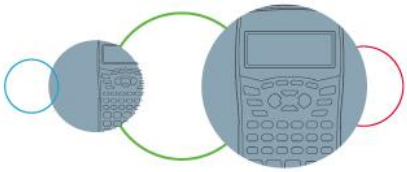
6.2.6. $\frac{1}{2}c(4c^2 + 16c - 10) - 8c^2$ (3)

6.3. For each of the stories given write down an algebraic expression:

6.3.1. Tshepi has a bag with 8 apples and 8 bananas. George has one less apple than Tshepi and three more bananas than Tshepi. How many apples and bananas do they have altogether? (3)

6.3.2. Bronwyn has 12 boxes with the same number of eggs in each. How many eggs does Bronwyn have? (1)

[25]



Question 7

7.1. Solve each of these equations for x:

7.1.1. $3(x-4)=6$ (3)

7.1.2. $\frac{x}{9}-5=-1$ (3)

7.1.3. $\frac{2x}{3}+20=10$ (4)

7.2. Sindiswa's mom is 3 times as old as Sindiswa is now. In 10 years-time Sindiswa will be half of her mom's age. How old is Sindiswa now? (3)

[13]

Question 8

8.1. Construct an equilateral triangle with sides equal to 4.5cm. (6)

8.2. Construct a line perpendicular to another line. (4)

8.3. Construct a 30° angle without using a protractor. (4)

[16]

Question 9

9.1. Say whether the following statements are true or false. If false, change the statement so that it becomes true:

9.1.1. All parallelograms are squares.

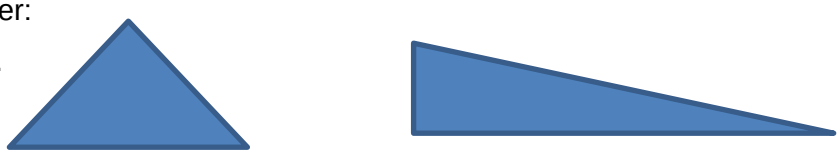
9.1.2. All squares are rhombi.

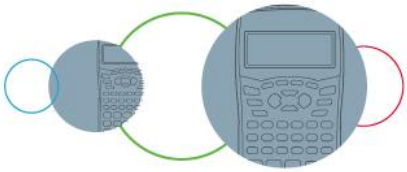
9.1.3. A scalene triangle has two sides that are equal.

9.1.4. Two intersecting lines with equal angles opposite each other are called corresponding angles.

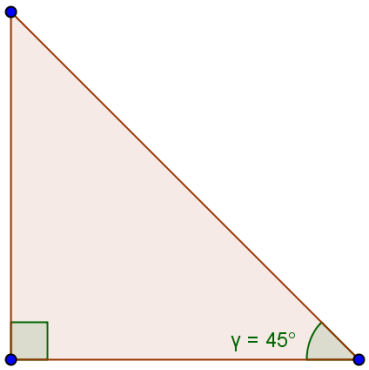
9.1.5. All parallelograms are trapeziums. (8)

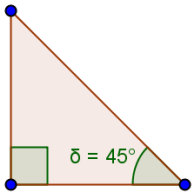
9.2. Say whether the following triangles are similar, congruent or neither and give reasons for your answer:

9.2.1.  (2)



9.2.2.





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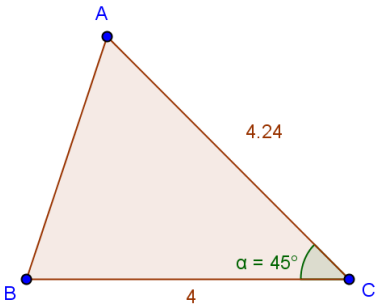
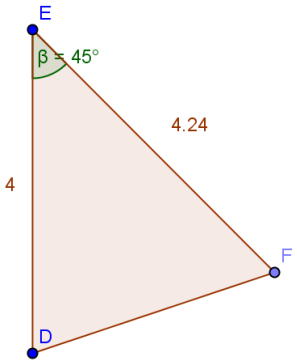
9.2.3.



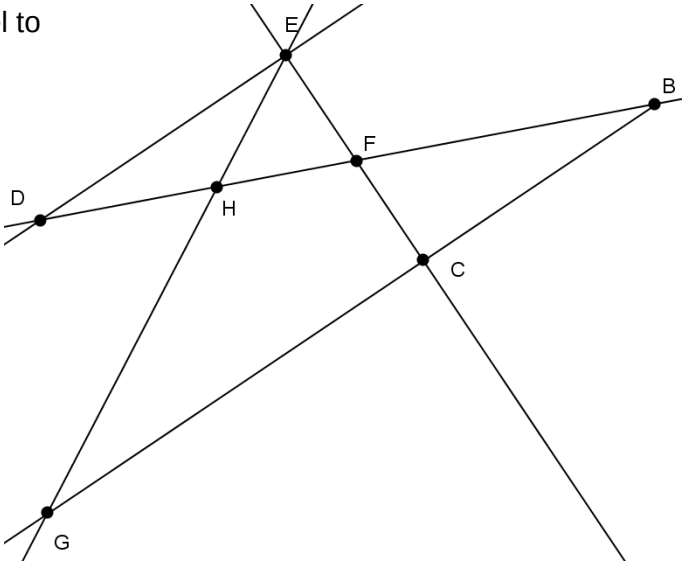


(2)

[14]

Question 10

10.1. Given the diagram on the right. DE is parallel to GB and EC is perpendicular to GB.

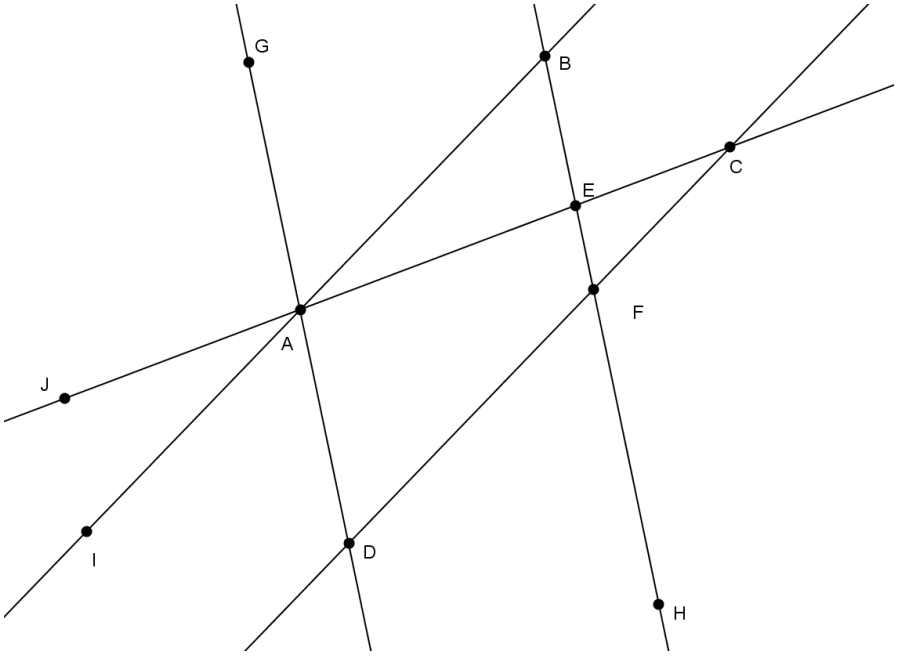


10.1.1. Prove that EC is also perpendicular to DE. (2)

10.1.2. Show that ΔDEH and ΔBGH are similar. (3)

10.1.3. Given that EF = FC, prove that ΔDEF is congruent to ΔBCF. (3)

10.2. Given the diagram below, GD ∥ BH and BI ∥ CD.



10.2.1. Is ΔACD similar to ΔCEF? Show all your working out. (4)

10.2.2. Find two other angles equal to $G\hat{A}B$. (2)

10.2.3. Given that $A\hat{D}F = 65°$ and $E\hat{C}F = 40°$ find the find the values for:

10.2.3.1. $J\hat{A}I$ (2)

10.2.3.2. $I\hat{A}D$ (2)

10.2.3.3. $J\hat{A}D$ (2)

[20]

Grand Total [150]