HILLCREST HIGH SCHOOL

Grade 8 Mathematics Exam
June 2017

MARKS: 200 **TIME: 2 hours**

NAME :											**CLASS:**			
TEACHER:											**DATE:**			
Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**	**Q11**	**Q12**		**TOTAL**	**%**
9	**20**	**7**	**21**	**20**	**5**	**39**	**35**	**14**	**12**	**12**	**6**		**200**	

INSTRUCTIONS

1. **This question paper consists of 12 questions. Answer ALL the questions.**
2. **You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.**
3. **Show ALL calculations clearly. Answers only will NOT necessarily be awarded full marks.**
4. **Round off ALL final answers to TWO decimal places, unless stated otherwise.**
5. **Indicate units of measurement, where applicable.**
6. **Maps and diagrams are NOT necessarily drawn to scale, unless otherwise stated.**
7. **Write neatly and legibly.**

Question 1:

Choose the most correct answer to each of the following questions. Circle your answer.

1.1 The cost of 0,5kg of mincemeat is R39.50. What is the cost of this mincemeat in R/kg?

a) R39.50/kg
b) R19.75/kg
c) R79.00/kg
d) R120.00/kg (1)

1.2 Determine the LCM of 3, 4 and 6

a) 90
b) 18
c) 30
d) 12 (1)

1.3 Calculate $7-18-(-9)$

a) -2
b) -20
c) -34
d) None of the above. (1)

1.4 The output of a flow diagram, which has a rule of $\sqrt{n+3}$, is 52. Calculate the input value.

a) Cannot be calculated
b) 7,42
c) 7,0
d) 7,7 (1)

1.5 Choose the correct algebraic language for "the quotient of t divided by 7 and then decreased by 7."

a) 0
b) $\frac{t}{7}-7$
c) $\frac{7}{t}-7$
d) $\frac{t}{7-7}$ (1)

1.6 Subtract $(3p^2)^3$ from $3p^2$.

a) $9p^6-3p^2$
b) $3p^5-3p^2$
c) $3p^2-27p^6$
d) $3p^2-3p^6$ (1)

1.7 Is the following expression.
$(4y^3)^2 + (y + 5)$, a ….

a) monomial
b) binomial
c) trinomial
d) quadnomial (1)

1.8 Determine the correct answer to $4qr^2$, if $q = 3$ and $r = 1$.

a) 12
b) 144
c) 24
d) 96 (1)

1.9 Which of the following is true?

a) $\frac{13}{0} = 13$
b) $\frac{13}{0} = 0$
c) $\frac{13}{0} =$ undefined
d) $\frac{\mathbf{13}}{\mathbf{0}} =$ irrational number (1)

[9]

Question 2

2.1 Arrange the following in descending order (2)

4,018 ; 4,18 ; 4,081 ; 4,811 ; 4,181 ; 4,0018

2.2 Round off each of the following to two decimal places : (4)

a) 0,0078_____

b) 1,293_____

c) 14,095_____

d) 94,1825_____

2.3 Calculate each of the following without the use of a calculator (4)

a) 5,98 + 4,73 b) 38,26 – 23,59

2.4 Complete the table (8)

Decimal	Fraction (in simplest form)	Percentage
0,45	a)	b)
c)	$\frac{3}{25}$	d)
e)	f)	6%
1,25	g)	h)

2.5 Complete the following : (2)

a) $\frac{3}{4} = \frac{}{16}$

b) $4\frac{4}{9} = \frac{}{9}$

[20]

Question 3

Maxine has to mix her baby's food in the ratio of one part of meat to four parts of vegetables.

3.1 Give the ratio of this mix for meat : vegetables. (1)

_____

3.2 If she had to prepare a meal containing 30g of food, how many grams of meat will she require? (3)

_____

_____

_

_____

3.3 Her baby consumes six of these 30g meals per day. How many days will a 500g packet of meat last her? Round your answer off to the nearest whole number. (3)

_____

_

_____

_____

[7]

Question 4

4.1 For the following statements, circle TRUE or FALSE.

a) Natural numbers can be divided into two groups, namely, even and odd numbers. True / False

b) Consider the following set $\mathrm{N} = \{1;2;3;4;5;.....\}$ True / False

c) The square roots of all natural numbers are also natural numbers. True / False

d) A prime number is a number that is divisible only by itself and one. True / False

e) The natural numbers more than 5 but less than 13 are: 6;7;8;9;10;11;12. True / False

f) The first 6 prime numbers are 2;3;5;7;9;11. True / False

g) A factor of a number is any number that divides exactly into the given number, with no remainder. True / False

h) The factors of 6 are: 1; 2; 3; 6. True / False

(8)

4.2 List:

a) The first 5 multiples of 3. _____ (2)

b) The factors of 20. _____ (2)

c) The prime factors of 20. _____ (2)

d) The odd numbers less than 12, which are composite. _____ (1)

e) The factors of 20, which are multiples of 20. _____ (1)

4.3 a) Express 324 as a product of prime factors.

324 = _____ (3)

b) Use your answer in a) to find the $\sqrt{324}$ **without the use of a calculator**.

$\sqrt{324}$ = _____ (2)

[21]

Question 5

5.1 Arrange the following in ascending order, from smallest to biggest : (2)

-2 ; 12 ; -55 ; 0 ; 58 ; $-3\frac{1}{3}$; $\frac{1}{5}$

_____

5.2 Simplify each of the following without the use of a calculator :

a) -2 x -3 x -4 _____ (1)

b) -2 + (-4) – (-5)_____ (2)

c) (-4 ÷ 2) x (-5 x -4)_____ (3)

d) $\frac{12-(-4)}{3+(-5)}$ _____ (3)

e) $\frac{9\,x\,(5-2)}{-3-6}$ _____ (3)

5.3 Write down the temperature in each of the following cases:

a) If the temperature of -15°C rises by 6°C (1)

_____

b) If the temperature of -7°C falls by 3°C (1)

_____

c) If the temperature of -2°C rises by 2°C by midday and then drops by 4°C (2)

_____

5.4 Consider the following bank statements of Person A and Person B. Person A has a bank balance of –R250 and person B has a bank balance of –R100.

a) What does the negative number of these persons' bank balances indicate? (1)

_____

b) What will the bank balance of Person A be if he pays in R150 into his account? (1)

_____

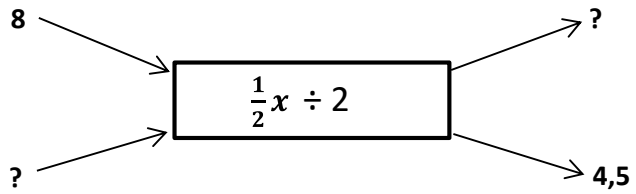
[20]

Question 6

6.1 Complete the next 2 terms of the following number sequence:

-12 ; -7 ; -2 ; _____ ; _____ ; (2)

6.2 Rewrite the following flow diagram in the form of an input x, output y table and calculate the missing values.



(3)

[5]

Question 7:

7.1 **Match** the question in column A to the correct answer from column B. Copy the Answer from Column B and write it next to its question in the answer column. The first one ** has been done for you.

Column A	**Answer**	**Column B**
a) $x + x$ **	$2x$ **	a^2b
b) 2a + a		0
c) 3ab – 5ab - a		3a
d) -1 x a		$2a - a^2$
e) a x b x a		2
f) a x b – b x a		-a
g) a x (4 + 2)		$2x$ **
h) $\frac{2}{a} \times a$		6a
i) 2a – a x a		-2ab - a

(8)

7.2 Are the following statements TRUE or FALSE, circle your choice, **if FALSE, give the correct answer.**

a) $2y + x = 2yx$ TRUE / FALSE _____

b) $x \times (1+5) \times y = 6 + xy$ TRUE / FALSE _____

c) $3z + y + x$ is in its simplest form. TRUE / FALSE _____

d) $7 + 8b + 2 = 9 + 8b$ TRUE / FALSE _____ (6)

7.3 Give an algebraic expression to fit the following sentences.

EXAMPLE: *Subtract c from d.* $d - c$

a) 11 added to y. _____

b) the product of 7 and d. _____

c) 7 multiplied by c plus 13. _____

d) Subtract 4 from c _____

e) Divide 8 by a. _____

f) 4 subtracted from y and then multiplied by 6. _____ (6)

7.4 Look at the following list of terms. **Circle** the **unlike term** in each list.

a) x; $2x$; y; $3x$

b) 4; $4a$; $2a$; $-a$

c) $3xyz$; $3xy$; $6xyz$; $-xyz$

d) xy; yx; $-2x$; $3yx$ (4)

7.5 Find the value of the following, if $a = 3$; $b = 2$; $c = 0$ and $d = 4$.

a) abd (2)

b) $\frac{d}{b}$ (2)

c) $ab - cd$ (3)

d) $2d(b + c)$ (3)

7.6 For the expression $4x^2 + 3$; write down:

a) the constant _____

b) the variable _____

c) the exponent _____

d) the coefficient _____

e) how many terms there are _____ (5)

[39]

Question 8

Simplify fully:

a) a + a + a = _____

b) 3b + 6b - 7b = _____ (2)

c) 2c + 6d + 5c - 3d = _____

d) 5wyz + yzw - 2zwy = _____ (4)

e) $2r^3 + 4r^3$ = _____

f) $(4t^2)(8t^3)$ = _____ (3)

g) $3a + 5a^2 + 6a + 7a^2$

= _____

h) $\frac{6a^2}{6a^2}$ = _____ (3)

i) $8v^4 - v^4$=_____

j) $\frac{4a^5}{4a^3}$ = _____ (3)

k) 2a(3+4b)

=_____

l) $6(2x+3y+4)$

=_____ (5)

m) $2(3x+y)+5x+y$

=_____

=_____

n) 6e(2f + 3g) + 3e(f - 4g)

=_____

=_____ (6)

o) $\frac{24a^5b^7}{12a^3b^2}$ = _____

p) $\frac{6h+10k}{2}$ = _____ (5)

q) $\frac{4m+8mn}{2m}+\frac{3m-6mn}{3m}$ = _____

= _____ (4)

[35]

Question 9

Find the solution to each of the following equations:

9.1 $2x-9=13$ (3)

9.2 $24=8+4x$ (3)

9.3 $6x+23=2x=9$ (4)

9.4 $5x-6=2x+3$ (4)

[14]

QUESTION 10

10.1 A certain number is multiplied by 3 and 10 is added. The result is 100. Find the number. (3)

10.2 A certain number has 10 added to it and the result is multiplied by 3. The total is 100. Find the number. (3)

10.3 Jon has *x* marbles. Sihle has four times as many as Jon and Ayanda has 5 more marbles than Sihle.

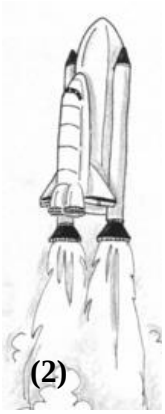
10.3.1 How many marbles does Sihle have, in terms of *x*? (1)

10.3.2 How many marbles does Ayanda have, in terms of *x*? (1)

10.3.3 If the three boys have 50 marbles altogether, write down a suitable algebraic equation to solve for *x* and say have many marbles Sihle has. (4)

[12]

Question 11

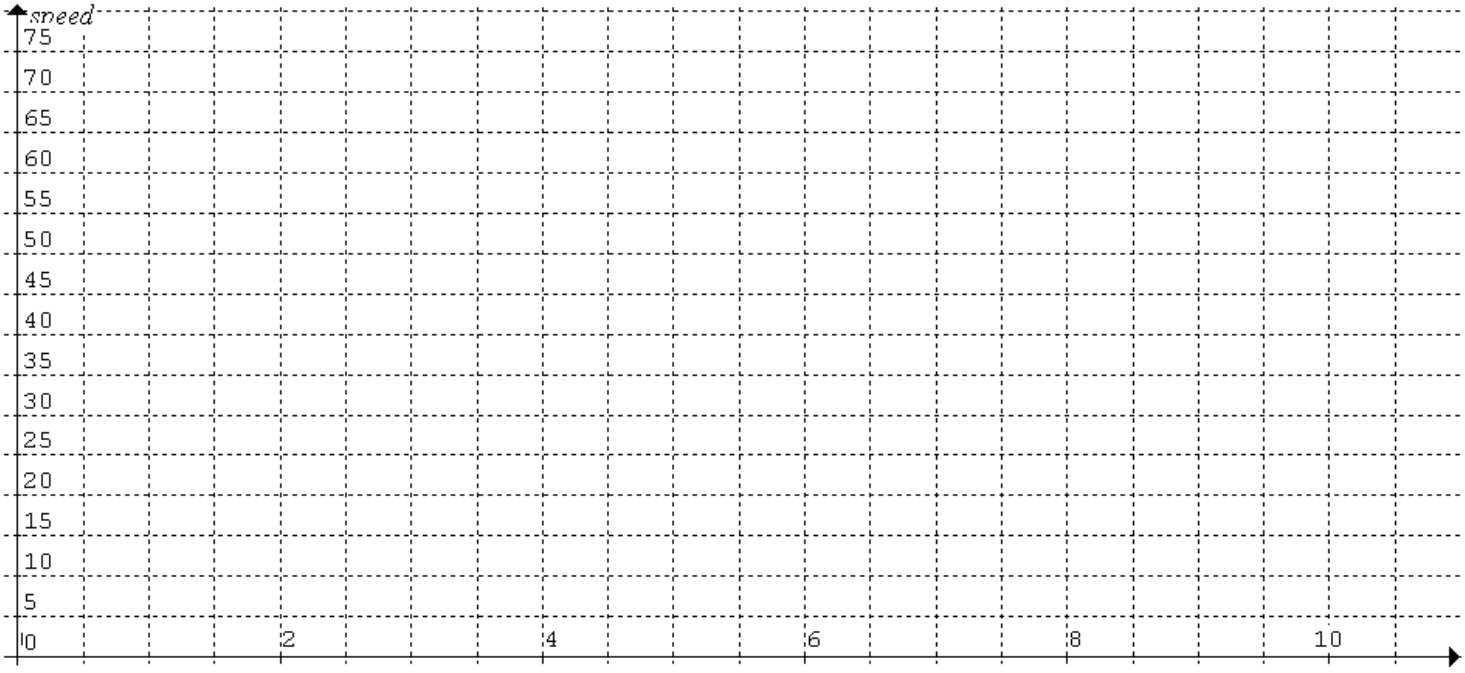


A rocket has an initial (starting) speed of 20km per second and it gains 5km per second in speed every second as shown in the table below:

Time in seconds (t)	0	1	2	3	4	5	10
Speed in km per second (s)	20						

11.1 Complete the table above. **(2)**

11.2 On the system of axes given below, draw the graph to show how the speed of the rocket changes as time changes. (3)

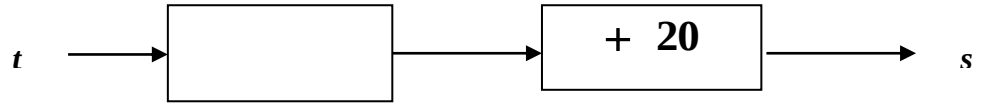


11.3 Use the graph to answer the following questions (show clearly on the graph how you obtained your answer)

11.3.1 What is the speed of the rocket after $\mathbf{2\frac{1}{2}}$ seconds? _____ (2)

11.3.2 After how many seconds was the rockets speed **60,75** km per second? _____(2)

11.4 Complete the diagram given below to show the computing procedure (rule) used to calculate the speed (s) of the rocket given the number of seconds (t).



(1)

11.5 Now write down the algebraic formula that describes the rule.

_____ (2)

[12]

Question 12

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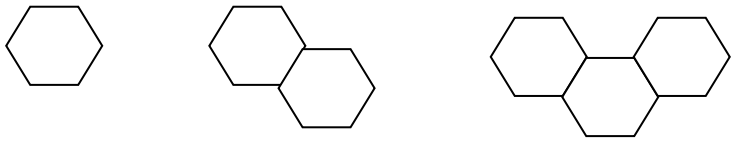

Look at the patterns above which have been made from matchsticks. The first shape, called a hexagon, is made from 6 matchsticks.

a. How many matchsticks have been used to make the second pattern which is two hexagons joined? (1)

_____

b. How many matchsticks will be needed to make the fourth pattern? (1)

_____

c. How many matchsticks will be needed to make a chain of 100 hexagons? (2)

_____

_

_____

d. Write down a rule to help you calculate the number of matchsticks (m) needed to make a chain of h hexagons. (2)

_____

__

_____

[6]