HILLCREST HIGH SCHOOL

Grade 8 Mathematics Exam

June 2018

MARKS: 200 TIME: 2 hours

NAME :											CLASS:			
TEACHER:											DATE:			
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12		TOTAL	%
9	10	14	23	12	27	8	11	17	33	15	21		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

1.1 Arrange the following in ascending order.

471340; 471430; 471034; 471304 (2)

_____

1.2 Complete the statement by using one of the following signs, to make the statement TRUE:
< or > or =

1.2.1 247 889 _____ 247 898 (1)

1.2.2 0,6205 _____0,625 (1)

1.2.3 $\frac{3}{5}$ _____ $\frac{5}{7}$ (1)

1.3 Round off each of the following to two decimal places : (2)

1.3.1 0,0067_____

1.3.2 1,462_____

1.4 Round off each of the following to one decimal place: (2)

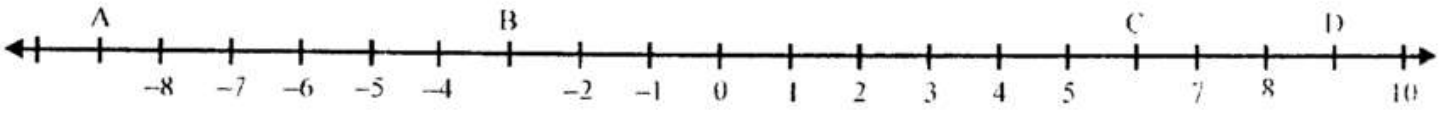
1.4.1) 14,087_____

1.4.2) 94,1264_____

[9]

Question 2

2.1 Some numbers are missing on the number line below:



2.1.1 Which numbers are missing at A, B, C and D? (4)

A _____ B _____

C _____ D _____

2.1.2 Which number has a greater value: **−10** or **−15**? Give a reason for your answer (2)

_____

_____

2.2 Complete the statements by filling in the numbers that would make the following statements true:

2.2.1 $67 + \square = -70$

2.2.2 $67 - \square = -70$

2.2.3 $67 - \square = 70$

2.2.4 $4 \times \square + 20 = 4$ (4)

[10]

Question 3

Simplify, without the use of a calculator (Show ALL working):

3.1 $\frac{3}{4} - \frac{1}{4}$ (2)

3.2 $\frac{3}{5} \times \frac{15}{6}$ (2)

3.3. $\frac{3}{4} + \frac{2}{6}$ (3)

3.4. $1\frac{2}{3} \div 2\frac{2}{5}$ (3)

3.5 Jack spends $\frac{1}{3}$ of the day at school and $\frac{3}{8}$ of the day sleeping. What fraction of the day is left for other activities? (4)

[14]

Question 4

4.1 Express each of the following in simplest form.

Write the following ratios in the simplest form. (1)

4.1.1) 3 : 15

4.1.2) 12 : 18 : 30 (1)

4.1.3) 7,5 : 22,5 (2)

4.2) Write the following in its simplest form:

4.2.1) There are 65 green marbles to every 15 blue marbles in a bag. (2)

_____

_____

4.2.2) There are 542 girls and 514 boys at Hillcrest High School. (2)

_____

_____

4.3 During the holidays Peter spent 2 hours gardening. He spent 45 minutes mowing the lawn, 20 minutes trimming the edges, 30 minutes weeding and the remainder of the time watering the flowers.

What fraction of the time (in the simplest form) did Peter spend:
Write the fraction of time as a fraction.

4.3.1) mowing the lawn? (2)

4.3.2) watering the flowers? (4)

_____

4.4 The dilution instructions on an Energade Sports Drink Concentrate are; dilution ratio (concentrate:water) 1 : 4.

4.4.1) Explain what is meant by this instruction. (2)

4.4.2) How many ml of concentrate and how many ml of water do you need to make up 1 litre of energy drink?. (4)

(3)

4.4.3) If your friend mixes 3 ½ cups concentrate with 15 cups of water, will her energy drink taste the same as the recommended dilution taste? Explain your answer.

[23]

Question 5

5.1 Convert each of the following to a percentage. Round your answers to 2 decimal places if necessary.)

5.1.1 A test result of 13 out of 20 (2)

5.1.2 480km out of a total of 660km. (2)

5.1.3 200 sheep out of 250 sheep (2)

5.2 Calculate each of the following showing all working:

5.2.1 Increase R1230 by 10% (3)

5.2.2 Decrease 580km by 5% (3)

[12]

Question 6

Calculate **without the use of a calculator**: (Show necessary working, answers only will not necessarily be awarded full marks. Use the marking allocation as a guide.)

6.1 -7×5 (1)

6.2 $(-6)^2$ (1)

6.3 $2+2(6-9)$ (3)

6.4 $\sqrt{9}$ (1)

6.5 $\sqrt[3]{8}$ (1)

6.6 $\sqrt{10^2-8^2}$ (3)

6.7 $\sqrt{-4\times-4}$ (2)

6.8 $\frac{\sqrt[3]{64}}{(-2)^2}$ (3)

6.9 3 x -3 + -2 x 1 (2)

6.10 $(-3)^3 + (-2)^2 + \sqrt{1}$ (2)

6.11 $\frac{-3-3}{-2+1}$ (2)

6.12 -3 x 0 + -3 X 1 (2)

6.13 $(2 \times -3)^2$ (2)

6.14 2×-3^2 (2)

[27]

Question 7

7.1.1 Express 576 as a product of its prime factors. (3)

7.1.2 Use your answer from (7.1.1) to find: $\sqrt{576}$ without the use of a calculator (2)

_____

_____

7.2 Find $\sqrt[3]{5832}$ by using the product of prime factors. (3)

[8]

Question 8

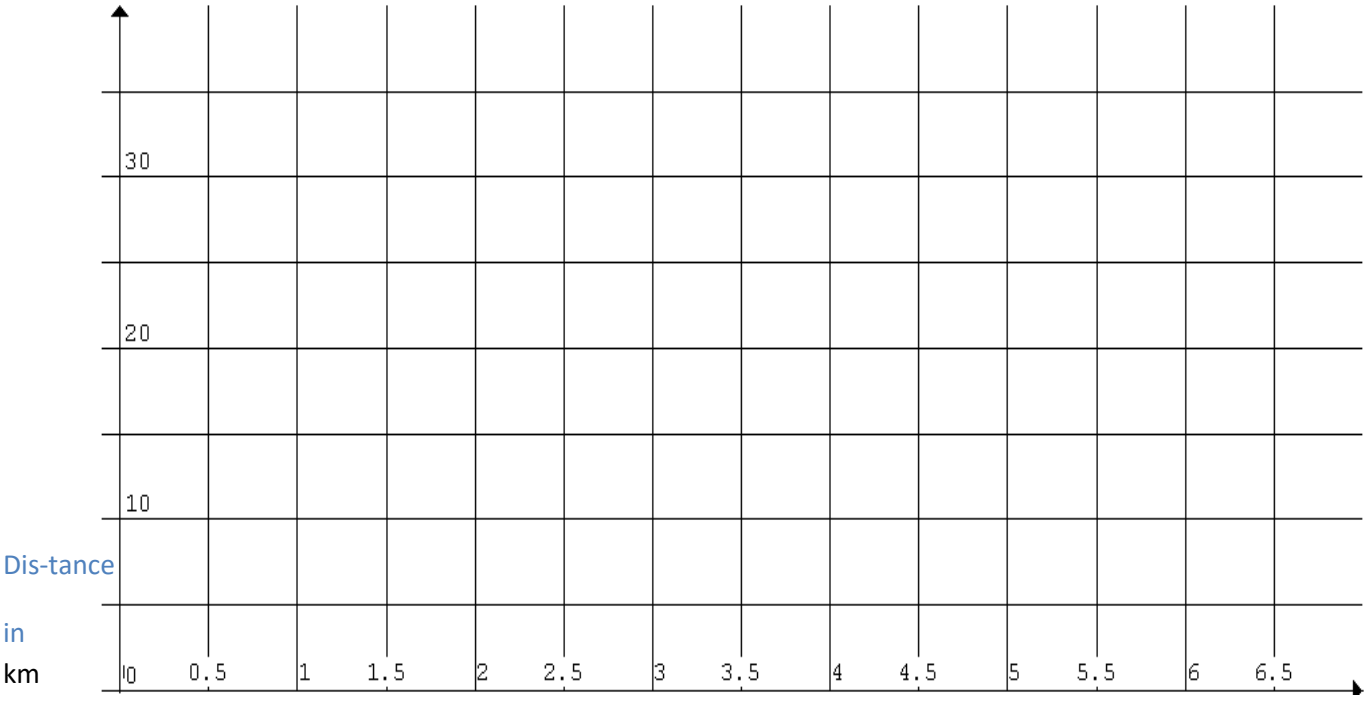
In a cross-country walk, Mrs Skjolde walks at a steady speed.

8.1 Complete the table below to show the distance in kilometers walked (d) after t hours.

No. of hours (t)	0	1	2	3	4	
Distance in km (d)	0	5	10		20	30

(2)

8.2 On the system of axes given below, draw the straight line graph to show how the distance walked changes as time changes. (3)



8.3 Use the graph to answer the following questions (show clearly on the graph how you obtained your answer). Readings from the graph may be approximate readings.

8.3.1 What distance was covered after $2\frac{1}{2}$ hours? _____ (2)

8.3.2 After how many hours did Mrs Skjolde walk 23 km ? _____ (2)

8.4 Complete the diagram given below to show the computing procedure (rule) we could use to calculate the distance (d) that Mrs Skjolde walked given the number of hours (t).

(1)

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

_____ (1)

Question 9

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

9.1.1) x; $2x$; y; $3x$

9.1.2) 4; $4a$; $2a$; $-a$

9.1.3) $3xyz$; $3xy$; $6xyz$; $-xyz$

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

9.2 Are the following statements TRUE or FALSE, <u>underline your choice</u>, if FALSE, give the correct answer**.**

9.2.1) $a \times b \times (3+2) = 5ab$ TRUE / FALSE _____

9.2.2) $2y + x = 2yx$ TRUE / FALSE _____

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

9.2.4) $3z + y + x$ is in its simplest form. TRUE / FALSE _____

9.2.5) $7 + 8b + 2 = 9 + 8b$ TRUE / FALSE _____

(7)

9.3 Give an algebraic expression to fit the following sentences.

EXAMPLE: *Subtract c from d.* <u>*d – c*</u>_____

9.3.1) 11 added to y. _____

9.3.2) the product of 7 and d. _____

9.3.3) 7 multiplied by c plus 13. _____

9.3.4) Subtract 4 from c _____

9.3.5) Divide 8 by a. _____

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

[17]

Question 10

10.1 Given the algebraic expression: $3x^4 \times y + 5x - 2 + 3 \div y$

10.1.1 How many terms are there in this expression?_____ (1)

10.1.2 What is the coefficient of *x*?_____ (1)

10.1.3 What is the constant term?_____ (1)

10.2 Given $5y^7$

10.2.1 Write down the base_____ (1)

10.2.2 Write down the power_____ (1)

10.2.3 Write down the exponent_____ (1)

10.3 Write in simpler (shorter) form:

10.3.1 $3 \times p$ (1)

_____

10.3.2 $m \times 4$ (1)

_____

10.3.3 $3a + 2a$ (1)

_____

10.3.4 $3a \times 2a$ (2)

_____

10.3.5 $3x^2 + 2x^2$ (1)

_____

10.3.6 $3x^2 \times 2x^3$ (2)

_____

10.3.7 $2 \times x \times y$ (1)

_____

10.3.8 $3 \times 4x + 2$ (2)

_____

10.3.9 $\frac{y^5}{y^2}$ (1)

_____

10.3.10 $x + 2y + 3x + 4y$ (2)

_____

10.3.11 $xy + xy + yx$ (2)

_____

_____

10.3.12 $2p^2q \times 4p^3q^3$ (3)

_____

_____

10.3.13 $3(x+4)$ (2)

_____

_____

10.3.14 $2(3x^2 + x) + 3x(x + 2)$ (4)

_____

_____

10.3.15 $\frac{12g^2+8g^5}{4g^2}$ (2)

_____

_____

[33]

Question 11

Solve for the unknown variable in each of the following equations, show necessary working:

11.1) $18 + a = 35$

(1)

11.2) $5k - 7 = 28$

(2)

11.3) $3 = -y + 5$

(2)

11.4) $5x = 3x + 2$

(3)

11.5) $3x + 1 = 5x - 5$

(3)

11.6) $\frac{35}{k} = 5$

(1)

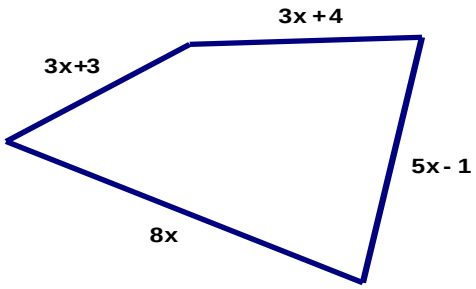
11.7) $5(y+3)=30$

(3) **[15]**

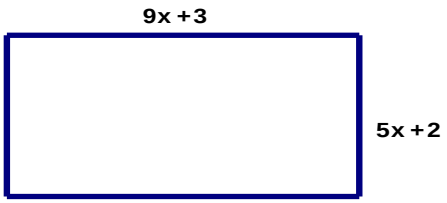
QUESTION 12

12.1 Determine the perimeter of each of the following, in terms of x:

12.1.1 (3)



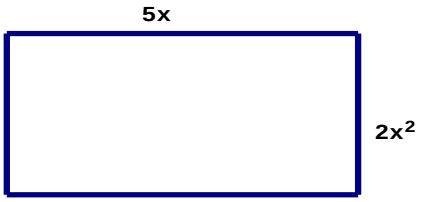
12.1.2 This shape is a rectangle (3)



12.2.1 If x= 8cm, calculate the perimeter of the shape in 12.1.1. (2)

12.2.2 If x =7cm, calculate the length of the longest side in 12.1.2. (2)

12.3 Area = length × breadth.



12.3.1 Use this information to find the area of the rectangle alongside,

in terms of *x*.

_____

_____ (2)

12.3.2 If the area of the rectangle is 1250cm², calculate the value of *x*. (3)

_____

_____

_____

12.4 If the area of a **different** rectangle is $15x^5$ and the length is $3x^3$, then how long is the breadth, in terms of *x*? (3)

_____

_____

_____

12.5 Des is 3 times as old as his son Jared. Jared is *x* years old. If in 10 years time Des will be twice as old as Jared, how old is Jared now? (3)

_____

_____

_____

[21]