

## Mathematics Assessment: Term 1 and 2

Examiner: Mrs J Hayman

Grade 8

115 marks

Calculators may NOT be used.

### Question 1

- Arrange the following in **ascending** order:

$-104; 93.2; -93; -100; 1000; 0.001; 4; -0.5$

[3]

### Question 2

- It has been estimated by scientists that the total weight of insects on earth is 70 times the total weight of humans.

.1. How many **kilograms of bugs** are there for every 60kg human? (2)

.2. If one bug weighs an average of 3mg,  
**how many bugs** are there for every 60kg human? (2)

.3. Assume the ratio of humans to bugs is  $1:1.4 \times 10^9$  (1.4 billion).

Complete the following ratio:

5 humans : \_\_\_\_\_ bugs (2)

[6]

### Question 3

- Look at the following pattern:

$-12; p; -2; 3; 8; 13; q; 23$

.1. What are the values of  $p$  and  $q$ ? (2)

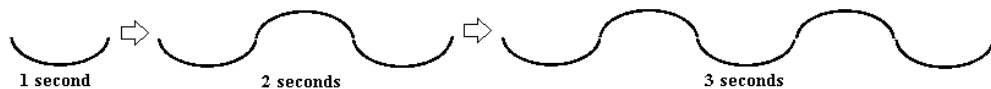
.2. Find a general rule for the pattern that will let you find the  $n^{th}$  term.

$T_n = \dots$  (2)

.3. Find the  $153_{rd}$  term of the sequence. (1)

[5]

### Question 4



- As a snake moves along the sand, the pattern it makes changes over time. Below is an example of that pattern.

.1. What will the pattern look like after 4 seconds? (1)

.2. Every second, new curves are added to the pattern. If we call the number of curves  $C$ , can you find a rule for the number of curves after  $n$  seconds. (3)

- .3. How many curves will be in the pattern after 1 minute? (2) [6]

**Question 5**

- .1. If  $y = 3x - 3$ , complete the table below. (2)

<u>x</u>	-2	-1	0	1	2	3	4	5
<u>y</u>	<u>(a)</u>	-6	<u>(b)</u>	<u>(c)</u>	3	6	9	<u>(d)</u>

- .2. Look at the table below. Find the rule in the form  $y = \dots$  (2)

<u>x</u>	-2	-1	0	1	2	3	4	5
<u>y</u>	-3	-1	1	3	5	7	9	11

[4]

**Question 6**

- Consider the following expression:

$$4y^2 - 2x^2 - 3xy + 13$$

- .1. How many terms are there? (1)  
 .2. What is the coefficient of  $x^2$ ? (1)  
 .3. Determine the value of the expression if  $x = 1$  and  $y = 2$ . (2) [4]

**Question 7**

- Simplify the following, showing all your working out:

.1.  $(2^3)^2$  (1)

.2.  $(4^4 \times 2^3) \div 2^{12}$  (2)

.3.  $\frac{-16x^2y}{-12xy^3}$  (2)

.4.  $\frac{17^4 \times 17^2}{17^5} - 4x(3x - x)$  (3)

.5.  $3(a - b) - 2(2a - b)$  (3)

.6.  $\frac{-(-y^2)^3 \times (-x^2z)^3}{-(-xyz)^2 \times (2zx)^0}$  (4)

.7.  $\sqrt{9x^{16} + (4x^{12} \times 4x^4)}$  (3)

.8.  $\frac{18p^2+9p}{-3p} + \frac{12p-12p^2}{4p}$  (4) [22]

### Question 8

- Solve the following equations:

.1.  $5x - 5 = x + 3$  (3)

.2.  $3 + 2x = 6x - 1$  (3)

.3.  $3(n + 2) = 2(n - 1)$  (3)

.4.  $4^x = 8^2$  (2)

.5.  $\sqrt{\frac{-27}{-3}}x^2 + 2x - \frac{12x^3}{4x} = 6$  (4) [15]

### Question 9

- The speed limit on a highway in Cape Town is  $100\text{km/h}$ .  
The fine for going over the speed limit is R40 for each km over the limit.

.1. Calculate the fine if the driver is travelling at  $130\text{km/h}$ . (2)

.2. Create a formula for the fine in Rands (F) for a motorist caught driving at a speed of  $x\text{km/h}$ . Assume  $x > 100$ . (3)

.3. If a driver receives a fine of R960, what speed was she going? (2) [7]

### Question 10

- .1. Pravan says that  $y = 2$  is the solution to  $\sqrt{8 - 7y^2} = y$ .  
Is he correct? Show your working out. (3)
- .2. Use any method to show that the two equations below are equivalent (the same).  
 $y = 4x - 1$                        $y = 3 + 4(x - 1)$  (2) [5]

### Question 11

- Hannah is making her own bikinis. She bought  $12\text{m}$  of material.  
The material costs R8 per metre, but some is not up to standard and is sold for R7 per metre.  
The total cost of the material is R92.
  - How many metres were up to standard and how many metres were not? (3)

- .2. If it takes  $\frac{2}{3}$  of a metre to make one bikini, how many bikinis can she make with the 12m she bought?(2)
- .3. How many of those will be of high quality material? (1)
- .4. She decides to sell a high quality bikini for R250 and a low quality bikini for R150.  
If she manages to sell 6 of each, how much money will she collect from her customers? (3)
- .5. She decides to keep the rest of the bikinis for herself and her friends. How much profit will she make? (1) [10]

**Question 12**

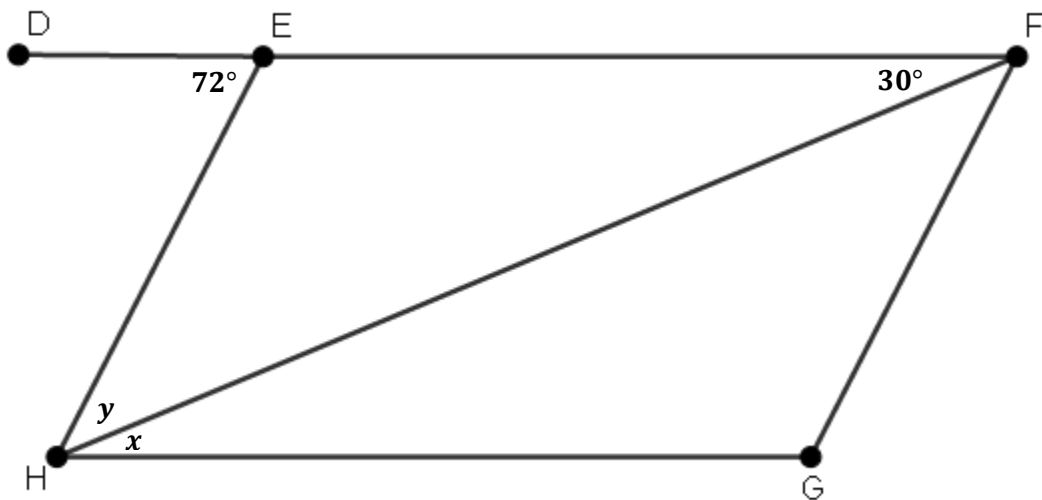
- JKLM is a square with the length (L) of one side equal to 3 units.  
The diagonals JL and KM are both equal to  $\sqrt{18}$  units.  
Show that to calculate the area of a square, the following two formulae are equivalent:

$$Area = L^2 \qquad Area = \frac{1}{2} \times (JL) \times (KM) \qquad [3]$$

**Question 13**

- - .1. Construct angle  $P\hat{Q}R = 60^\circ$ . (1)
  - .2. Construct the bisector of  $P\hat{Q}R$ . Call it QS. (3)
  - .3. Measure  $S\hat{Q}P$  with a protractor. (1) [5]

**Question 14**

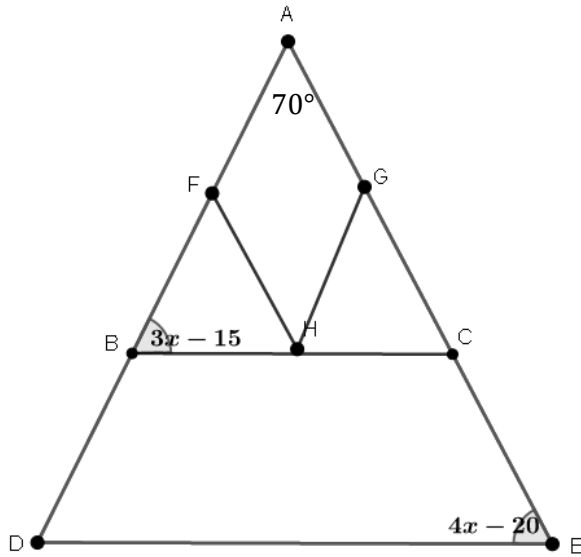


EFGH is a parallelogram.

Find the value  $x$  of  $y$ . Remember to give reasons for your answers!

[5]

**Question 15**

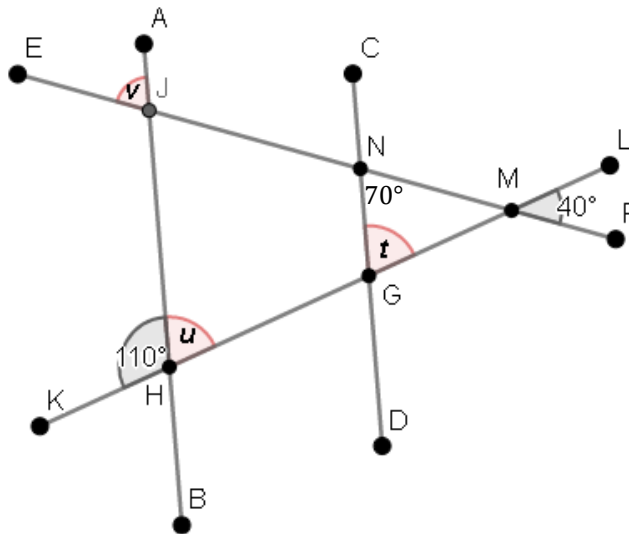


Given:  $BC \parallel DE$

1. Solve for  $x$ . (4)
2. Calculate the size of angle  $G\hat{C}H$  if  $x = 15^\circ$ . (1)

[5]

**Question 16**



1. Find the value of  $t$ . (3)
2. Find the value of  $u$ . (2)
3. Prove  $AB \parallel CD$ . (1)
4. Find the value of  $v$ . (3)
5. What kind of triangle is  $\triangle JM H$ ? (1) [10]

**TOTAL: {115}**