

WINGEN HEIGHTS SECONDARY SCHOOL
 GRADE 10 - 2020
 HOLIDAY ASSIGNMENT (MATHS)

Question 1

Choose from the following list:

0; $-\sqrt{\frac{9}{16}}$; $4\pi + 1$; $\sqrt{-9}$; $\frac{48}{6}$; $(\sqrt[3]{10})^3$; 3,14

- 1.1 A positive rational number, but not an integer. (2)
 - 1.2 A counting number smaller than 8. (2)
 - 1.3 All the irrational numbers. (2)
 - 1.4 A non-real number. (2)
 - 1.5 An integer that is a multiple of 4. (12)
- [10]

Question 2

2.1 The following sequence is given:

5; 1; -3; -7; ...

- 2.1.1 Give the following two values in the sequence. (1)
- 2.1.2 Determine the formula for the n^{th} term of the sequence. (2)
- 2.1.3 What is the value of the twentieth term of the sequence? (2)
- 2.1.4 Which term of the sequence will be -387? (2)

2.2 Natural numbers are stacked in a pyramid form.

Row 1	1
Row 2	2 3 4
Row 3	5 6 7 8 9
Row 4	10 11 12 13 14 15 16

- 2.2.1 How many numbers are in the 7th row? (1)
- 2.2.2 What is the last number in row 7? (1)
- 2.2.3 What is the first number in row 7? (1)
- 2.2.4 How many numbers are in the n^{th} row? (2)

2.3 Consider the following sequence:

3; 6; 11; ...; 38; 51

The general term for the sequence is $T_n = n^2 + 2$

- 2.3.1 Determine the value of the missing two terms. (2)
 - 2.3.2 Which term in the sequence will be equal to 291? (2)
- [16]

Question 3

3.1 Determine the following products:

3.1.1 $(3x^2 + 4y)(2x^2 - 5y)$ (3)

3.1.2 $(\frac{1}{2}a^2 - \frac{1}{3a^2})^2$ (3)

3.2 Factorise fully:

3.2.1 $2x^2 - 10x + 12$ (3)

3.2.2 $18y^2 + 12y - 30ay - 20a$ (3)

3.2.3 $2(a - b)^2 - 3a + 3b$ (3)

3.2.4 $24x^4 + 3xy^3$ (3)

3.3 Simplify:

$\sqrt{36x^2 - 24xy + 4y^2}$ (3)

Question 4

Simplify fully:

4.1 $\frac{8x^2+12x}{4x^2-9} \times \frac{2x^2-11x+12}{16x-1}$ (4)

4.2 $\frac{a}{b} \div (\frac{1}{c} - \frac{1}{b})$ (3)

4.3 $\frac{3}{x+1} + \frac{2}{1-x^2}$ (4)

[11]

Question 5

5.1 Solve for x:

5.1.1 $2x^2 - x = 1$ (3)

5.1.2 $\frac{m}{x} + \frac{n}{2x} = 3m$ (2)

5.1.3 $2^3x + 2^{3x+2} = 40$ (3)

5.1.4 $-3 < 2 - 5x \leq 7$ (3)

5.2 Make a the subject of the formula:

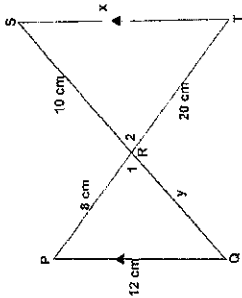
$K = \frac{a+1}{a+2}$

5.3 Solve for x and y in:

$2x + 3y = 8$ and $3x + 4y = 11$

(4) [18]

7.3



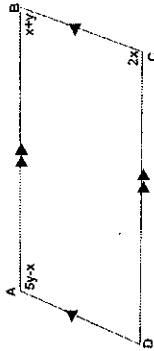
- 7.3.1 Prove fully that $\triangle PQR \parallel \triangle TSR$. (4)
- 7.3.2 Calculate x and y . (4)

[15]

Question 8

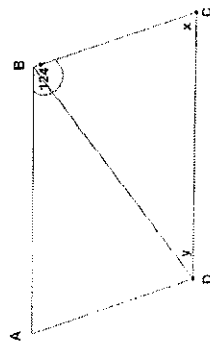
- 8.1 Determine with reasons the values of x and y in the following figures:

8.1.1



(7)

8.1.2

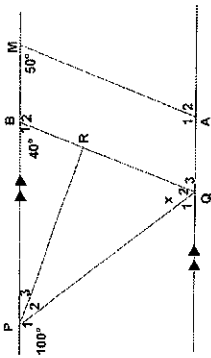


ABCD is a rhombus

(4)

8.2

Question 6



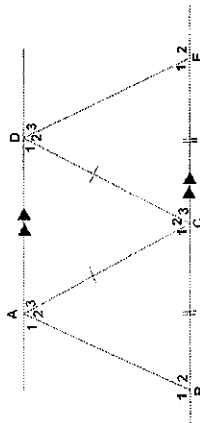
- 6.1 Calculate the value of x . (2)
- 6.2 Is $AM \parallel QB$? Explain. (2)
- 6.3 If $RQ = 7$ cm, $QP = 25$ cm and $PR = 20$ cm, determine if $\triangle PQR$ is a right angled triangle. (3)

(7)

Question 7

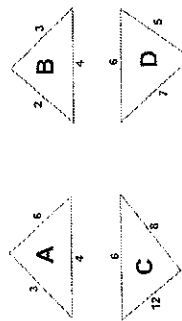
Prove fully:

7.1 $\triangle ABC \cong \triangle DEC$



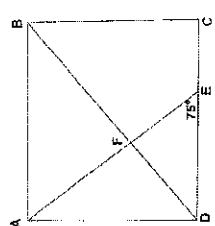
(5)

- 7.2 Name, with reasons, two triangles that are similar.



(2)

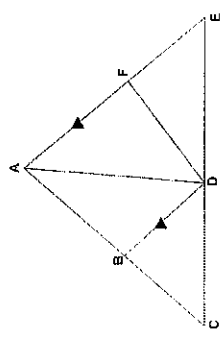
ABCD is a square. AE intersects DB in F and DC in E. $\angle AED = 75^\circ$. Find $\angle AFB$.



(5)
[16]

Question 9

In $\triangle ACE$ is $BD \parallel AE$, BD bisects $\angle CDA$ and FD bisects $\angle ADE$. Determine the size of $\angle DFE$. (Hint: Make $\angle CDB = x$ and $\angle ADF = y$)



[6]

TOTAL MARKS : 120