EXAMINATIONS COUNCIL OF ESWATINI
Junior Certificate Examination

CANDIDATE NAME									
CENTRE NUMBER					CANDIDATE NUMBER				

MATHEMATICS **309/02**

Paper 2 **October/November 2019**

2 hours

Candidates answer on the Question Paper.

Additional materials: 3-figure tables

Geometrical Instruments

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
Electronic calculators should **not** be used.

Answer **all** questions.
Write **all** answers in the spaces provided.
All working should be clearly shown below each question.
3-figure tables may be used in any question where necessary.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 100.

For Examiner's Use	
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Total	

This document consists of **13** printed pages and **3** blank pages.

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1 **(a)** From the list of numbers $\frac{7}{3}$, $\sqrt{16}$, π , 19 , $\sqrt{2}$, 2

write down

(i) two irrational numbers,

Answer (a)(i)…….,…….....[2]

(ii) two prime numbers,

Answer (a)(ii)…….,……[2]

(iii) two integers.

Answer (a)(iii)……...[2]

(b) Work out $\frac{7+18}{21+6\times9}$, leaving your answer as a fraction in its simplest form.

Answer (b) ……....[3]

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2 Expressed as a product of its prime factors, $40 = 2^3 \times 5$.

(a) Express 50 as a product of its prime factors.

Answer (a)…….……...[2]

(b) Find the highest common factor of 40 and 50.

Answer (b)…….……...[2]

(c) Find the lowest common multiple of 40 and 50.

Answer (b)……..……...[2]

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3 The price of a television set is E 9800.00 .

This price excludes 14% value added tax (VAT).

(a) Calculate the amount of the VAT on price of the television set.

Answer (a)……..……...[3]

(b) Find the total cost of the television set.

Answer (b)……..……....[2]

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4 **(a)** Solve the equation $11 - 3k = 5$.

Answer (a)……..……...[2]

(b) Simplify completely

(i) $\frac{8h^3}{9} \times \frac{3h^2}{10h^4}$,

Answer (b)(i)……..……...[2]

(ii) $\frac{27t^3}{14} \div \frac{9t}{7}$,

Answer (b)(ii)……..……...[2]

(iii) $3p^2q(pq - 5q) + 2q(2p^2q - 7)$.

Answer (b)(iii)……..……...[3]

5 Precious is given E x as her pocket money every week.
She saves a fifth of her pocket money every week.

(a) Write down an expression in terms of x for,

(i) the amount she saves every week,

Answer (a)(i)……..……...[1]

(ii) the amount she uses every week, expressing your answer as a single fraction.

Answer (a)(ii)……..……...[3]

(b) The amount Precious saves in 7 weeks is the same as E 50 more than her weekly pocket money.

(i) Write down an equation in terms of x to show this information.

Answer (b)(i)……..……...[2]

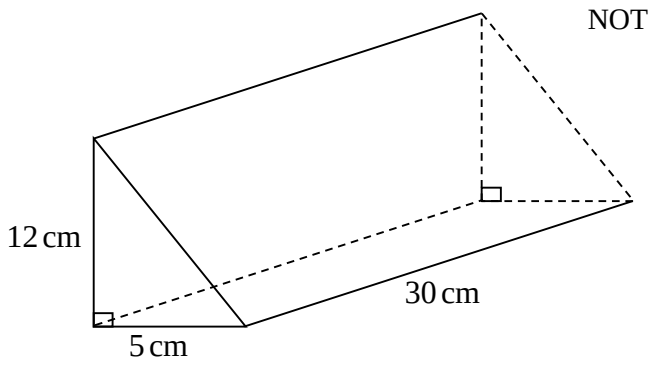
(ii) Solve the equation in **(b)(i)**.

Answer (b)(ii)……..……...[3]

(c) Hence, calculate the amount she uses in 7 weeks.

Answer (c).....……..……...[2]

6 The diagram shows a prism.



(a) Write down the special name for this prism.

Answer (a).....[1]

(b) Draw a sketch of the net of the prism.

Answer (b).....[2]

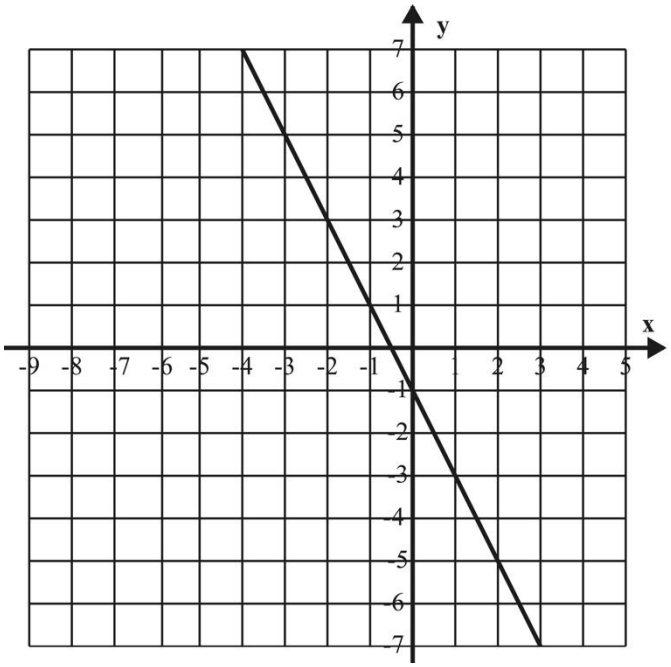
(c) Calculate the volume of the prism.

Answer (c).....[3]

(d) Calculate the total surface area of the prism.

Answer (d).....[5]

7 The graph below shows a line whose equation is $y = mx + c$ passing through (2 , - 5) and (-3 , 5).



(a) Find the value of

(i) *c*,

Answer (a)(i)……..[1]

(ii) *m*.

Answer (a)(ii)……..[2]

(b) On the same grid, draw the line $y = x + 5$. [3]

(c) Use your graphs to solve the simultaneous equations

$y = x + 5$
$y = mx + c$

x = ……..and y = ……[3]

8 In the diagram below, $AB = 7\,\text{cm}$, $BF = 11\,\text{cm}$, $CE = 5\,\text{cm}$, $B\hat{F}E = 15^o$ and $E\hat{D}C = 32^o$.

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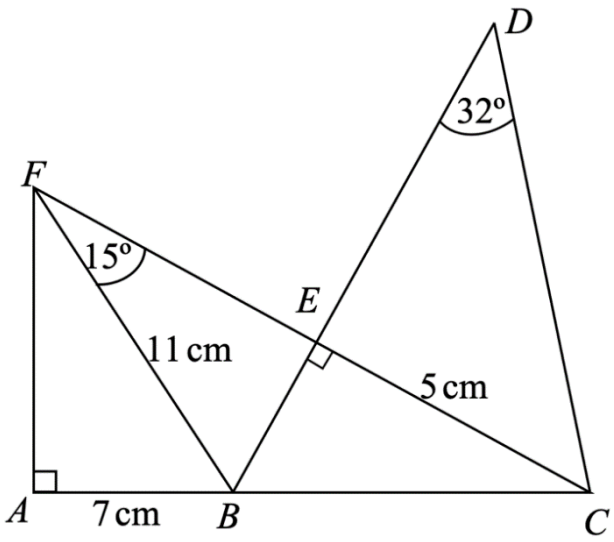


(a) Leaving your answer as a fraction,

State

(i) Cos $A\hat{B}F$,

Answer (a)(i)……..[2]

(ii) sin $A\hat{F}B$.

Answer (a)(ii)……..[1]

(b) Use 3-figure tables to find

(i) $\sin 15°$,

Answer (b)(i)…….....[1]

(ii) $\tan 32°$.

Answer (b)(ii)…….....[1]

(c) Calculate *BE*, given that $BE = 11\sin 15^o$.

Answer (c)…….... [2]

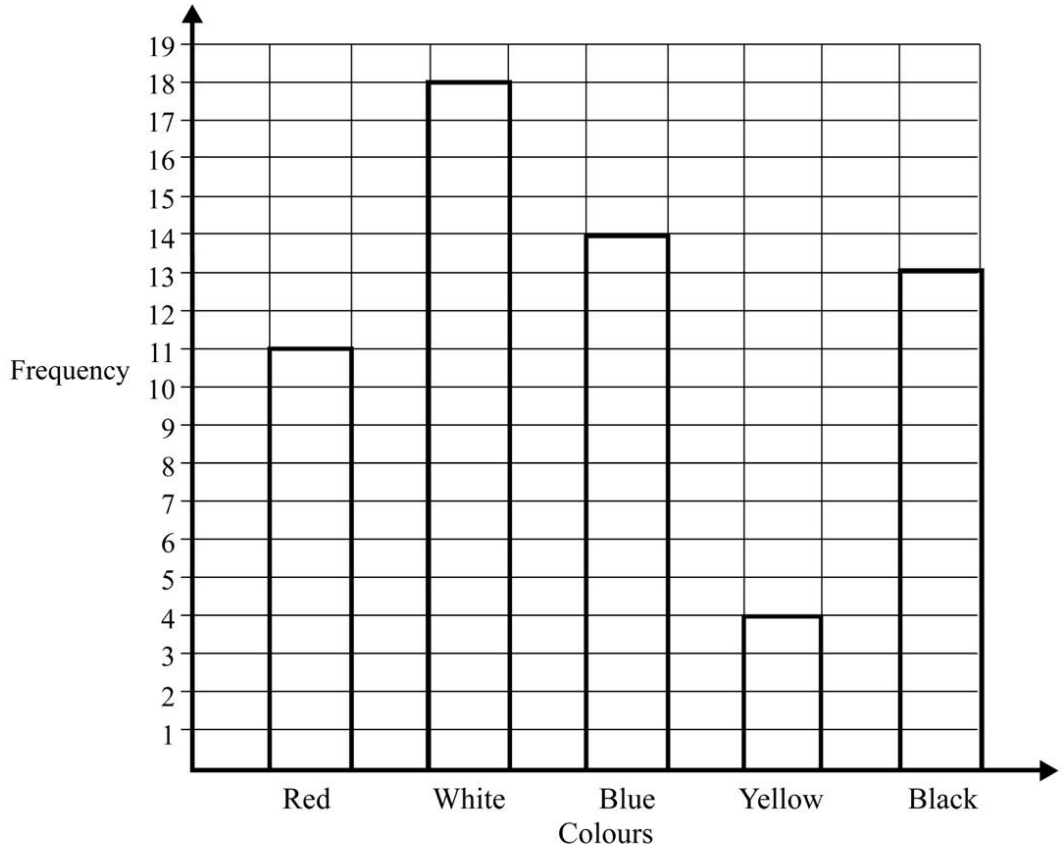
(d) Calculate $E\hat{C}D$.

Answer (d)…….... [2]

(e) Find *DE* given that $DE = 5\tan E\hat{C}D$.

Answer (e)…….....[2]

9 The bar chart shows different colours of T-shirts worn by a group of 60 students.



(a) Complete the following frequency table to show the above information.

Colours	**Number of students**
Red	
White	
Blue	
Yellow	
Black	

[5]

(b) A pie chart is to be drawn to show this information.

Complete the table below to show the sector angle for each colour.

Colours	Sector angle
Red	
White	
Blue	
Yellow	
Black	

[5]

(c) Using a radius of 3 cm, draw a pie chart to show this information.

[3]

(d) Find the probability that a student chosen at random from this group wore

(i) a white T-shirt,

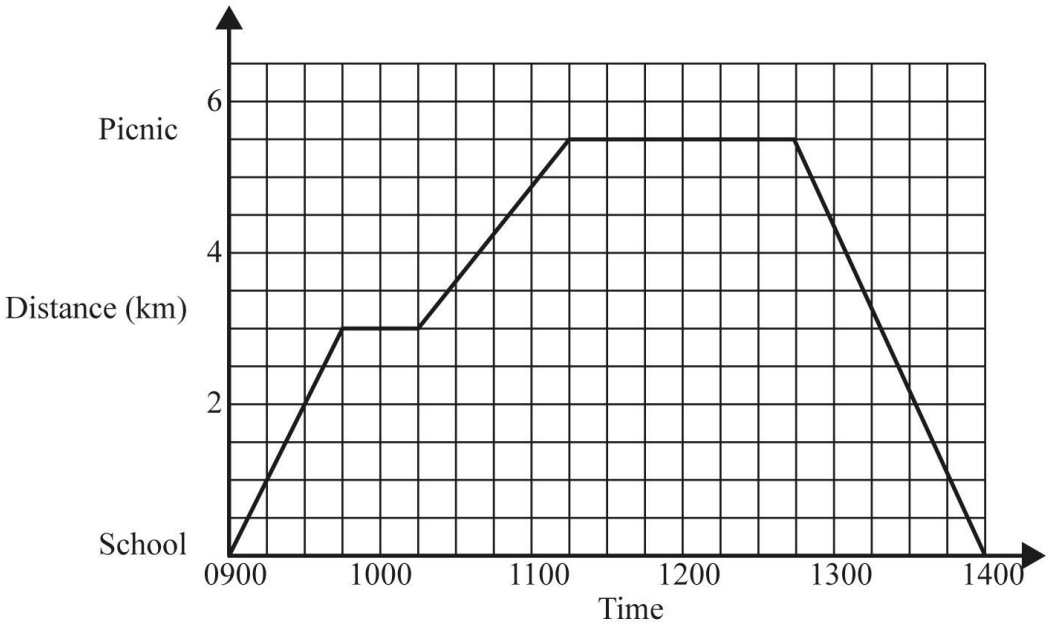
Answer (d)(i)…….…….……..... [1]

(ii) a yellow or red T-shirt.

Answer (d)(ii)…….…….……..... [2]

10 A group of students decided to take a walk from school to a nearby picnic site.

The graph shows their journey.



(a) Write down the distance from school to the picnic site.

Answer (a)……..[1]

(b) How long did they spend at the picnic site?

Answer (b)…….... [2]

(c) **(i)** Calculate the time it took them to reach the picnic site.

Answer (c)(i)……..... [2]

(ii) Calculate the time they took from the picnic site to school.

Answer (c)(ii)…….……..... [2]

(iii) Find how much more time they spent going to the picnic site than returning to school.

Answer (c)(iii)…….……..... [2]

(d) Calculate the students' average speed during the first 2 hours of the journey.

Answer (d)…….…….…….....[3]

(e) At what time were the students 5 km from school, on their journey to the picnic site?

Answer (e)…….…….…….....[1]

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