WESTMINSTER INTERNATIONAL UNIVERSITY IN TASHKENT
An Accredited Institution of the University of Westminster (UK)

UNIVERSITY OF WESTMINSTER

ONLINE MATHEMATICS ENTRANCE EXAMINATION

DATE: July 14, 2020

TIME: 16.00-17.30

1. You have 1 hour and 30 minutes for the exam.

2. You must answer all questions.

3. No calculators are allowed.

4. Type your answers in the spaces below the questions.

5. Answers with no evidence of calculations will not score any marks. Workings and answers written on any other page will not be considered.

6. You will need a computer connected to high speed Internet and stable electricity (You cannot take online math entrance exam on mobile phone).

Please note additional requirements:

7. Applicant will be automatically disqualified from the examination and will receive a score of 0 for the exam and exam administration fee payment will not be reimbursed:
   a) If he/she leaves the room during the examination.
   b) If he/she talks, whispers, or turns around.
   c) If he/she found to have any unauthorized materials during the examination
   d) If he/she caught cheating in the examination.
   e) If he /she fails to show contents of his/her pockets or any other containers to the invigilators.
   f) If he/she is found to have a mobile phone or other electronic device (switched on or off) on his/her room/table during the exam.

8. During the examination period, any technical problems including poor internet connection from applicant's side that may cause an applicant to leave the examination environment is under the applicant's responsibility.
9. Applicant *cannot* re-join the exam and continue the examination process. Once you leave the examination or you disconnect, you cannot continue the exam.
10. Invigilator may conduct room security checks at any point during your exam. You must perform all requested security checks. Loss of time during these security checks cannot be made up.
11. Please follow detailed exam instruction sent to applicant's personal account via admission system.
12. Applicant has to follow the instruction strictly during the examination.

Applicant ID: _____

All questions on this paper must be answered.

Write the answers in the space below each question.

Working must be shown for all stages of the questions.

1. Orange paint is made by mixing red paint and yellow paint in the ratio 7:4.

Mr Martin has 40 litres of red paint and 20 litres of yellow paint.

What is the maximum amount of orange paint he can make?

(3 marks)

2. Factorise the following expressions

   a) $2x^2 + 7x - 15$

   (2 marks)

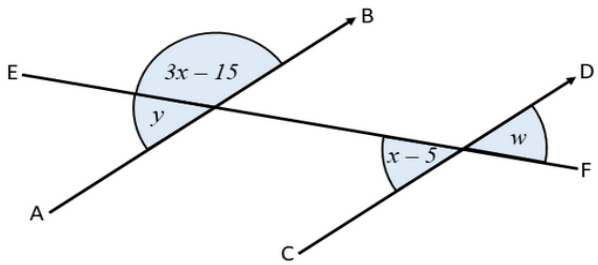
   b) $6w^2 - 7w - 10$

   (2 marks)

   c) $8y^2 + 10y - 3$

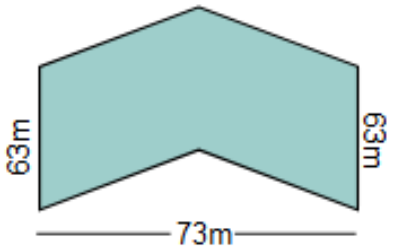
   (2 marks)

3. Find the values of *w, x* and *y* from the diagram below.
   All values are in degrees. You must show all your workings.



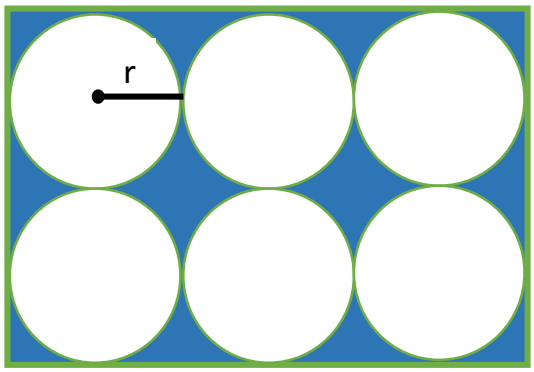
(6 marks)

4. a) Find the area (in m^2) of the shape below



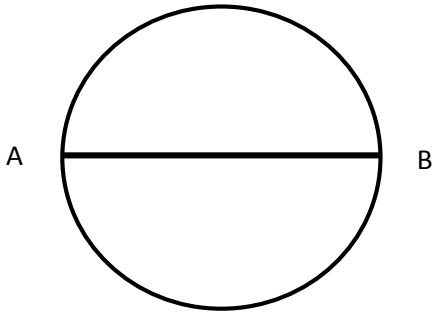
(2 marks)

b) Find the area of the shaded region in terms of r, the radius of the circles.



(3 marks)

5. a) The diagram below shows a circular training track. Ana and Beth have a race. Ana runs from A to B along the diameter. Beth starts at A and runs all the way around the track. How much further does Beth run than Ana? (Use 3.14 as the value of π)



(3 marks)

b) A furniture shop sells chests of drawers in 2 different widths, “standard” and “wide”. The cost, ***S*** pounds (£), of a standard chest of drawers with ***d*** drawers may be calculated using the formula: $\boldsymbol{S} = 29 + 15\boldsymbol{d}$

A standard chest of drawers is £119. Calculate the number of drawers this chest has

(3 marks)

6.

On a map of scale 1:200 000 the distance between Buckingham Palace and the Tower of London is 3.7cm.

What is the actual distance in kilometers?

(3 marks)

7. On a farm, $4\frac{1}{2}$ acres out of every 15 acres of the land are used to grow crops.

Wheat is grown on $\frac{5}{8}$ of the land used to grow crops.

What percentage of the total area of the land on the farm is used to grow wheat?

(2 marks)

8. Here is a chart of distances in the solar system

Planet	Distance from the Sun (km)	Mass (tonnes)
Mercury	5.79×10^{7}	3.3×10^{20}
Venus	1.08×10^{8}	4.87×10^{21}
Earth	1.5×10^{8}	5.98×10^{21}
Mars	2.28×10^{8}	6.42×10^{20}
Jupiter	7.78×10^{8}	1.9×10^{24}
Saturn	1.43×10^{9}	5.69×10^{23}
Uranus	2.87×10^{9}	8.68×10^{22}
Neptune	4.5×10^{9}	1.02×10^{23}

a) Which planet has the second largest mass?

(2 marks)

b) Find the difference between the mass of Jupiter and the mass of Saturn. Express this in standard form

(3 marks)

c) Ana says “It is approximately 10 times further from the Sun to Saturn then from the Sun to Earth”. Is Ana right? You must show your workings.

(2 marks)

9. a) Simplify then find the square root of this expression

$$\frac{y}{(1-y)^2} - \frac{y}{1-y}$$

(3 marks)

b) Make b the subject of the following formula.

$$a = \frac{7(3b-c)}{b}$$

(2 marks)

c) If a = 7, b = − 3 and c = − 10, calculate a + 2b – c

(2 marks)

10.

The Ward family from England are going on holiday to Thailand. They have a total of £1225 which they want to change into Thai baht The exchange rate is 1.6 baht = £1.

a) How many baht do they receive?

(2 marks)

b) On the way home they have 250 baht left. They convert it back into UK pounds (£) This time the exchange rate is £0.75 = 1 baht. How many pounds do they receive?

(2 marks)

11. a) Patrick bakes 420 cupcakes.

He makes them in three flavours – vanilla, banana and lemon. 120 of the cakes are vanilla flavoured. 35% are banana. How many lemon cakes does Patrick make?

(2 marks)

b) In 2000 the world population was 6.1 billion. By 2020 it was 7.8 billion. By what percentage has it risen in 20 years? Give your answer to the nearest whole number.

(3 marks)

c) In a sale in a hardware store all hammers are reduced in price by 25%.
A hammer is now $12.75. What was the original price of the hammer?

(3 marks)

12. At a seaside stall ice cream comes in six flavours.

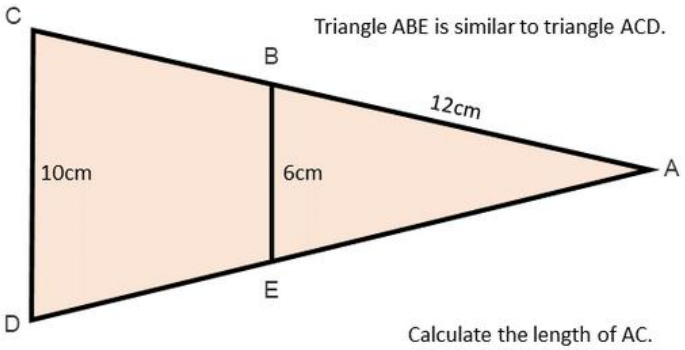
Paulo want two *different* scoops.

How many different combinations of flavour can he have?

You must show all your workings.

(3 marks)

13.

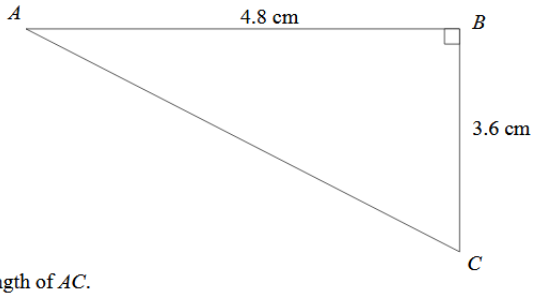


Triangle ABE is similar to triangle ACD.

Calculate the length of AC.

(3 marks)

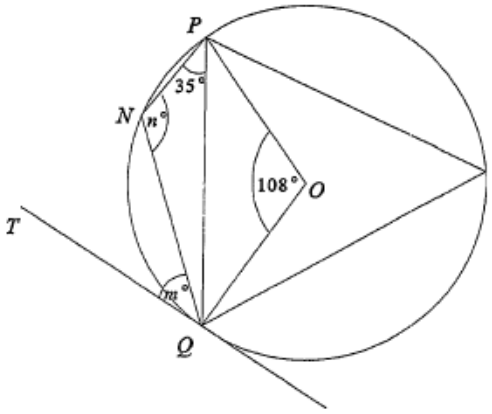
14.



Calculate the length of AC.

(3 marks)

15.



The diagrams are NOT accurately drawn.

O is the centre of the circle.
P, K, Q and N are points on the circumferance.
QT is the tangent to the circle at Q.
Angle $POQ = 108°$
Angle $NPQ = 35°$

Calculate the values of ***m*** and ***n.*** (4 marks)

END OF TEST