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

UNIVERSITY OF WESTMINSTER

ONLINE MATHEMATICS ENTRANCE EXAMINATION

DATE: AUGUST 6, 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. Given two equations

$$\frac{4^x}{2^{x+y}} = 8 \text{ and } \frac{9^{x+y}}{3^{5y}} = 243$$

find the values of x and y.

(5 marks)

2.

If x_1 and x_2 are the roots of the equation $x^2 - 15x + 36 = 0$,

determine the value of $|x_1 - x_2|$.

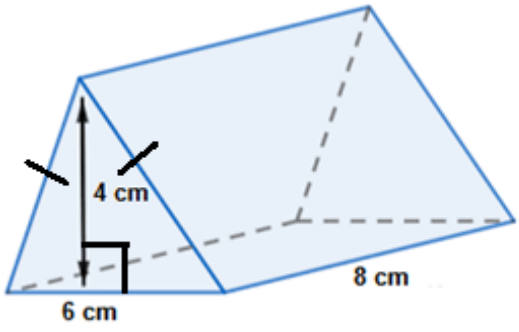
(4 marks)

3. Simplify trigonometric expression

$$\frac{1 - cos2x}{1 + tan^2 x}$$

(3 marks)

4. Isosceles triangular prism is given.



a) Find the volume of the shape

(2 marks)

b) Find the surface area of the prism

(2 marks)

5.

a) Simplify

$$\frac{3^{3-4n} \cdot 9^{3+4n}}{27^{n+3}}$$

(3 marks)

b) Make *z* the subject of the formula

$$x = \frac{8 - Wz}{7z - t}$$

(3 marks)

6.

When a parabola represented by the equation $y - 2x^2 = 8x + 5$ is translated 3 units to the left and 2 units up, find vertex of the new parabola.

(4 marks)

7.

A sequence of figures is created with dots as shown.

If this pattern continues, how many dots will be in Figure 10?

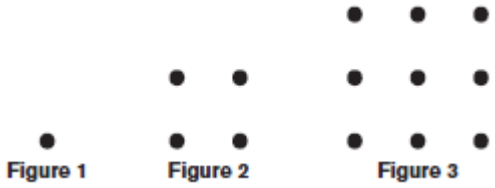
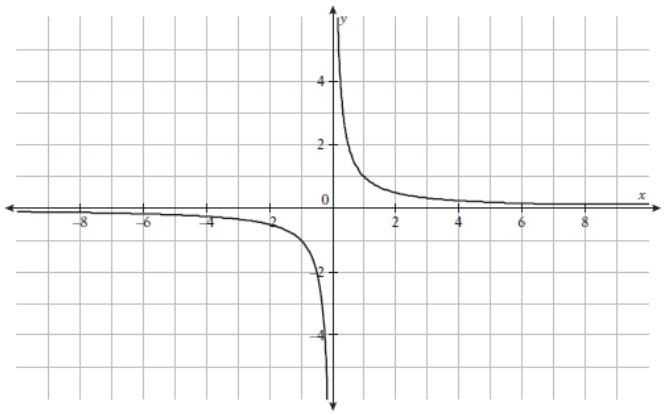


Figure 1 Figure 2 Figure 3

(3 marks)

8.

a) What is the domain and range of function $y = \frac{1}{x}$?

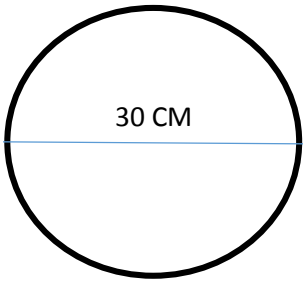


(4 marks)

b) If $f(x)$ is a linear function such that $f(2) = 5$ and $f(4) = 13$, then write the equation of the function.

(4 marks)

9.



Circle is given with diameter 30cm.

a) What is the circumference of the circle?

(2 marks)

b) Find the area of the circle.

(2 marks)

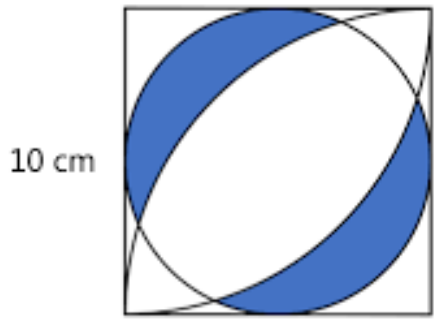
10.

Calculate

$$\frac{3+\sqrt{7}}{3-\sqrt{7}} - \frac{3-\sqrt{7}}{3+\sqrt{7}}$$

(3 marks)

11. Find the area of the shaded region.



(6 marks)

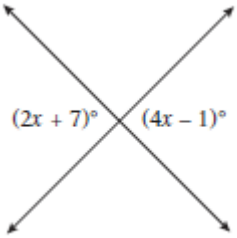
12.

Michael has a total of $10,000 invested in two municipal bonds that have yields of 9% and 12% interest per year, respectively. If the interest Michael receives from the bonds in a year is $1080, how much does he have invested in each bond?

(5 marks)

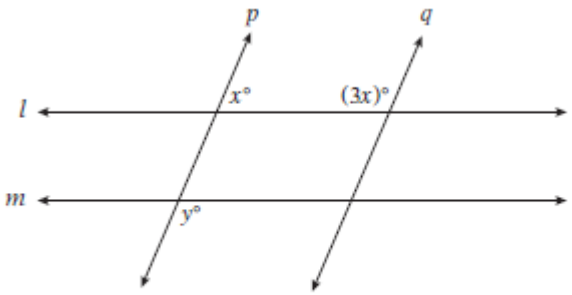
13.

a) Find the value of x.



(2 marks)

b) Find y.



In the figure above, $l \parallel m$ and $p \parallel q$

(3 marks)

14.

The distance between two points $P(3, x)$ and $Q(13, -12)$ is equals to 26. What is the value of x?

(3 marks)

15.

Work out the following examples

a)

$$\frac{1}{2} - \frac{2}{3} - \frac{3}{4}$$

(2 marks)

b)

$$2\frac{3}{4} - 1\frac{2}{3} \div \frac{2}{5}$$

(2 marks)

c)

$$\frac{4.5(61) - 3.1(23)}{0.(76)}$$

(3 marks)

END OF TEST