

ONLINE MATHEMATICS ENTRANCE EXAMINATION

DATE: JULY 28, 2020

TIME: 11.00-12.30

- 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.

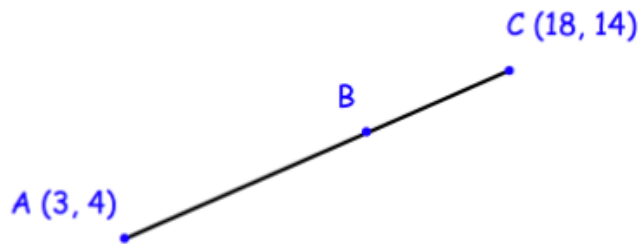
Applicant ID:

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.



ABC is a straight line.

AB : BC = 3 : 2

What are the coordinates of point B? *You must show your workings.*

(3 marks)

2.

a) List the integers described by this inequality $-1 \leq x < 8$

(1 mark)

b) Solve the inequality $x^2 > 3(x + 6)$

(4 marks)

3.

a) $(x - 5)$ is a factor of $x^3 - 6x^2 + 3x + a$. What is the value of a ?

(2 marks)

b) Make w the subject of

$$y = \frac{5(x + w)}{w}$$

(2 marks)

4.

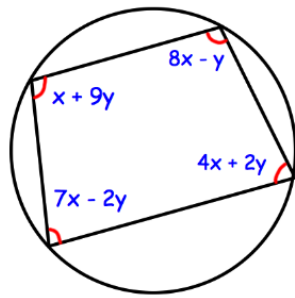
Solve the equation

$$\frac{16^{2x+5}}{4^x} = 32$$

(5 marks)

5.

The diagram below shows a quadrilateral within a circle. Find the values of x and y .



(5 marks)

6.

Solve the simultaneous equations

$$2x + 4y - z = 15$$

$$3x + 8y + z = 44$$

$$x + 2y + 2z = 15$$

(8 marks)

7.

Ana earns $3x$ dollars per day. Beth earns $4x$ dollars per day.

Charlize earns 75% more than Ana. Diana earns 30% less than Beth.

Charlize earns \$147 more than Diana. Work out how much money each person gets.



(6 marks)

8.

a) Here are the first 5 terms of a sequence. What is the n^{th} term of this sequence?

31 27 23 19 15

(2 marks)

b) Using your formula from part a) to calculate the first negative term in the sequence

(2 marks)

9.

A pizza restaurant offers 6 different types of topping.
Ana wants a pizza with 2 different types of topping.
How many different pizzas could she order?



(2 marks)

10.

a) a is directly proportional to the square root of b .

When $a = 50$, $b = 4$. Find a in terms of b .

(2 marks)

b) A washing machine is reduced in a sale by 18%. The sale price is \$ 295.20

What is the normal price of the washing machine?

(2 marks)

11.

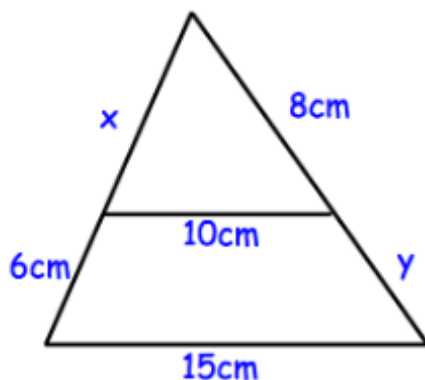
A swimming pool has a leak. It loses 5% of its water every minute.
How long would it take to lose 30% of its original volume of water?

(4 marks)



12.

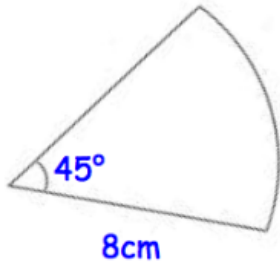
From the diagram below calculate the values of x and y .



(5 marks)

13.

Find the total perimeter of this sector. Use 3.14 as the value of π .



(4 marks)

14.

Show that $\frac{3x+6}{x^2-3x-10} \div \frac{x+5}{x^3-25x}$ simplifies to ax where a is an integer.

(4 marks)

15.

Two bottles are similar. Bottle A is 15 cm tall. Bottle B is 20 cm tall.

The volume of bottle A is 400 cm^3 . What is the volume of bottle B?

Give your answer to the nearest cm^3 .



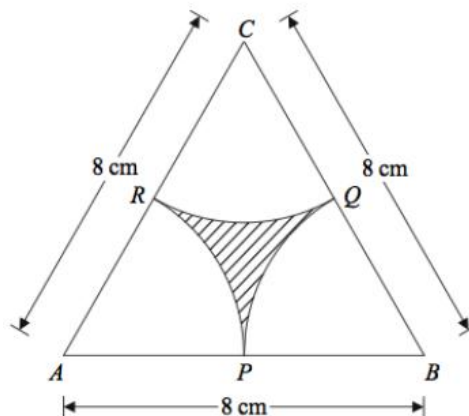
Bottle A



Bottle B

(3 marks)

16. ABC is an equilateral triangle. Calculate the area of the shaded region.



(4 marks)

END OF TEST