

Paper 1 example question A

Find the value of

$$\log_3(27^1 \times 27^{\frac{1}{2}} \times 27^{\frac{1}{4}} \times 27^{\frac{1}{8}} \times 27^{\frac{1}{16}} \times \dots)$$

A 0

B 2

C 6

D 8

E 9

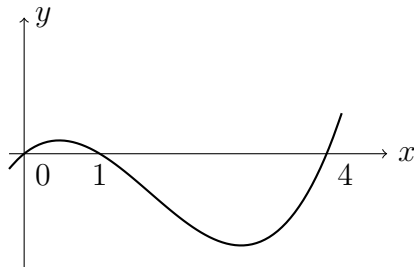
F $\log_3 2$

G $\log_3 8$

H $\log_3 54$

Paper 1 example question B

This diagram shows part of the graph of $y = x(x - 1)(x - 4)$ drawn accurately.



Which of the following correctly describes **all** of the positive values of u for which

$$\int_0^u x(x - 1)(x - 4) \, dx = 0?$$

- A** $u = 1$ only
- B** $u = 4$ only
- C** $u = 1$ and $u = 4$ only
- D** One value of u with $1 < u < 4$ only
- E** One value of u with $u > 4$ only
- F** One value of u with $1 < u < 4$ and one value of u with $u > 4$ only
- G** There are no positive values of u for which this is true

Paper 2 example question A

Consider the following statement about real numbers a and b :

$$(*) \quad a^2 > b^2$$

Which of the following is true?

- A** The condition $a > b$ is **necessary** but **not sufficient** for $(*)$ to be true.
- B** The condition $a > b$ is **sufficient** but **not necessary** for $(*)$ to be true.
- C** The condition $a > b$ is **necessary and sufficient** for $(*)$ to be true.
- D** The condition $a > b$ is **not necessary** and **not sufficient** for $(*)$ to be true.

Paper 2 example question B

Which one of the following statements is true?

- A **For all** real numbers b , **there exists** a non-zero real number a such that **for all** real numbers c , $ax + b$ is a factor of $ax^3 - bx^2 + c$.
- B **For all** real numbers b , **there exists** a non-zero real number a such that **for all** real numbers c , $ax + b$ is **not** a factor of $ax^3 - bx^2 + c$.
- C **There exists** a real number b such that **for all** non-zero real numbers a , **there exists** a real number c such that $ax + b$ is a factor of $ax^3 - bx^2 + c$.
- D **There exists** a real number b such that **for all** non-zero real numbers a , **there does not exist** a real number c such that $ax + b$ is a factor of $ax^3 - bx^2 + c$.