

## TMUA: Index of Questions (20 pages; 14/12/24)

[\* = recommended]

### Algebra

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2022, P2, Q4

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2018, P1, Q13 (turning points)

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2019, P1, Q7 (gradient)

2019, P2, Q14 (increasing function)

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2020, P2, Q1 (intersection of curves)

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2021, P1, Q14 (number of solutions)

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2021, P2, Q7 (circle & square)

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2022, P1, Q17\* (triangles)

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2019, P2, Q18

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2017, P1, Q12

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2017, P1, Q17

2017, P2, Q10

2018, P1, Q1

2018, P1, Q12

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2019, P1, Q8 (Trapezium rule)

2019, P1, Q9

2019, P1, Q10

2019, P1, Q12

2019, P1, Q16

2019, P2, Q13 (Trapezium rule)

2020, P1, Q11

2020, P1, Q14

2020, P2, Q6

2020, P2, Q12 (Trapezium rule)

2020, P2, Q13

2021, P1, Q7

2021, P1, Q10 (Trapezium rule)

2021, P1, Q13

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2022, P1, Q7

2022, P1, Q12 (indices)

2023, P1, Q1

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2020, P1, Q15

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2018, P2, Q13 (errors in proof)

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2019, P2, Q4 (counterexamples)

2019, P2, Q5 (necessary & sufficient conditions)

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2020, P2, Q7 (sufficient conditions)

2020, P2, Q8 (error in reasoning)

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2020, P2, Q20 (if and only if)

2021, P2, Q4 (counterexamples)

2021, P2, Q5 (error in reasoning)

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2021, P2, Q8 (necessary & sufficient conditions)

2021, P2, Q9 (sufficient conditions)

2021, P2, Q10 (counterexamples)

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2022, P2, Q7 (error in reasoning)

2022, P2, Q10 (“there exists ...”)

2022, P2, Q11 (necessary & sufficient conditions; geometry: kite)

2022, P2, Q13 (“there exists ...”)

2022, P2, Q17 (error in reasoning)

2023, P2, Q3 (counterexamples)

2023, P2, Q4 (error in reasoning)

2023, P2, Q5 (necessary & sufficient conditions)

2023, P2, Q7 (necessary & sufficient conditions)

2023, P2, Q9 (converse, contrapositive; pentagon)

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Specimen, P2, Q12 (remainders)

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2016, P1, Q13 (number of roots)

2016, P1, Q19 (expansion)

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2019, P2, Q2

2020, P1, Q2

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2020, P1, Q20

2020, P2, Q18 (cubics)

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## **Probability**

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**Proof:** See Logic

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2019, P2, Q16\*

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2020, P1, Q6

2020, P1, Q8

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2017, P2, Q6

2017, P2, Q15

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2023, P1, Q18\*

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2017, P1, Q14

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2018, P1, Q14

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2020, P1, Q17

2021, P2, Q14

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2018, P1, Q18\*

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2020, P1, Q9\*

2021, P1, Q18\* (rotation of curve)

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Specimen, P1, Q18

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2016, P1, Q10 (number of solutions of equation)

2016, P1, Q17 (inequality)

2016, P2, Q3 (equation)

2017, P1, Q8 (inequality)

2017, P2, Q12 (graphs)

2018, P1, Q6 (number of solutions of equation)

2018, P1, Q20\*

2018, P2, Q4 (number of solutions of equation)

2019, P1, Q14 (simultaneous equations)

2019, P1, Q17 (inequality)

2019, P1, Q19

2020, P1, Q18

2020, P2, Q2

2020, P2, Q9

2020, P2, Q15

2021, P1, Q19 (equation)

2021, P2, Q18\*

2021, P2, Q19\*

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2022, P2, Q18\* (matching curves to equations)

2022, P2, Q20 (composite functions)

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2023, P1, Q12\* (number of solutions of equation)

2023, P2, Q12 (number of solutions of equation)

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2017, P2, Q8 (comparing the values of expressions)

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2017, P2, Q13 (standard form)

2019, P1, Q13 (maximum value of function)

2019, P2, Q9\* (sitting at circular table)

2021, P1, Q5 ( $f(mn) = f(m)f(n)$  )

2023, P2, Q15 (base 2)