Question 1

QUESTION 2

Simple Familiar
Technology Free
2021

When the polynomial $P(z) = z^3 - iz^2 - z - i$ is divided by $z - i$, the remainder is

(A) $-2i$

(B) 0

(C) $2i$

(D) $4i$

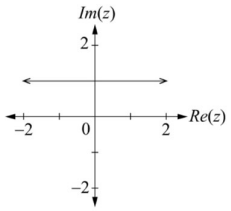
Question 2

QUESTION 6

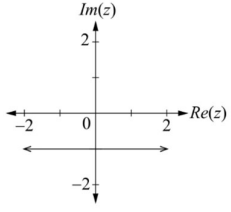
Simple Familiar
Technology Free
2021

The subset of the complex plane that represents $|z| = |z - 2|$ for $z \in C$ is

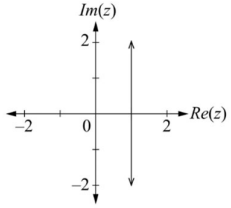
(A)



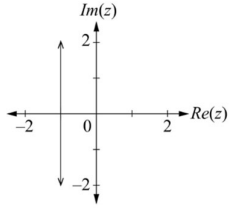
(B)



(C)



(D)



Question 3

QUESTION 3

Simple Familiar
Technology Free
2022

A particle travels in a straight line over time, t, with a constant acceleration, $a(t)$.

Which function could represent the particle's displacement, $x(t)$?

(A) $x(t) = t^3$

(B) $x(t) = t^2$

(C) $x(t) = \frac{1}{t}$

(D) $x(t) = \sqrt{t}$

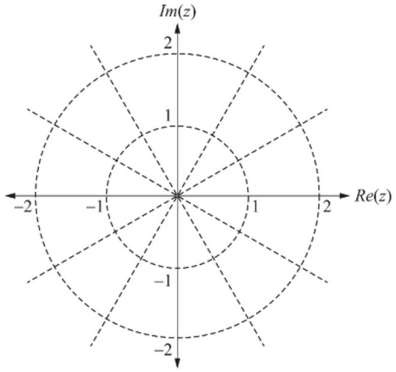
Question 4

QUESTION 15 (4 marks)

Simple Familiar
Technology Free
2022

Consider the equation $z^3 = 1$ where $z \in C$.

a) Sketch the solutions to $z^3 = 1$ on the Argand diagram. *[2 marks]*



The solutions to $z^3 = 1$ can be expressed in the form $z = a + bi$, where $a,\ b \in R$.

b) Determine the largest possible positive value of ab. *[2 marks]*

Question 5

QUESTION 18 (6 marks)

Complex Unfamiliar
Technology Free
2020

Consider the function $P(z) = 2z^4 + az^3 + 6z^2 + az + b$ where $a, b \in Z^+$

One of the roots of $P(z)$ is $z = -i$

Determine the possible value/s for a and b such that all remaining roots of $P(z)$ have an imaginary component.