002_2

Saturday, November 29, 2025 7:01 PM

First question *6 marks* each item 1 mark

Choose the correct answer from those given :

(1) The function $f : [-2, 4] \to \mathbb{R}$, $f(X) = 4 - 2X$ is negative in the interval .....

(a) $[-2, 0[$ (b) $]0, 4]$ (c) $[2, 4]$ (d) $]2, 4]$

(2) If the two roots of the equation : $X^2 - 6X + k = 0$ are equal , then k = ...

(a) 9 (b) 6 (c) 1 (d) 12

(3) The quadratic equation whose two roots are $(1 + i)$, $(1 - i)$ is .....

(a) $X^2 - 2X + 2 = 0$ (b) $X^2 + 2X - 2 = 0$

(c) $X^2 + 2X + 2 = 0$ (d) $X^2 - 2X - 2 = 0$

(4) If one of the two roots of the equation : $aX^2 - 3X + 2 = 0$ is the multiplicative inverse of the other root , then a = ...

(a) $\frac{1}{2}$ (b) 3 (c) 2 (d) -2

(5) If $f : f(X) = aX^2 + bX + c$ is positive for all real values of X , then .....

(a) $b^2 - 4ac < 0$ (b) $b^2 - 4ac > 0$ (c) $b^2 - 4ac = 0$ (d) $b^2 - 4ac \le 0$

(6) Which of the following are the factors of the expression $(X^2 + 9)$?

(a) $(X - 3)(X + 3)$ (b) $(X + 3)^2$

(c) $(X - 3i)^2$ (d) $(X - 3i)(X + 3i)$

Second question *4 marks* (1) 2 marks (2) 2 marks

Determine the sign of each of the two functions defined by the following rules , representing your answer on the number line :

(1) $f(X) = (X - 1)(X + 2)$ (2) $f(X) = -X^2 + 9$

$4 - 2X = 0$ $\boxed{X = 2}$

sign + + + + | − − − − −

X −2 2 4

$4 = 2X$

$]2, \infty[$

$a = 1$ $b = -6$ $C = K$

$b^2 - 4ac = 0$

$36 - 4 \times 1 \times K = 0$

$36 - 4K = 0$ $\frac{4K}{4} = \frac{36}{4}$ $\boxed{K = 9}$

$L + M = (1+i) + (1-i)$ $L.M = (1+i)(1-i)$

$\boxed{L + M = 2}$ $= 1 - i^2 = 2$

$i^2 = -1$

$\boxed{1 + 1}$

$\boxed{x^2 - 2x + 2 = 0}$

$\boxed{x^2 - (L+M)x + L.M = 0}$

$L.M = \frac{c}{a}$

$\frac{1}{1} = \frac{2/a}{1}$

$2/a = 1$ $\boxed{a = 2}$

$L + M = \frac{-b}{a}$ add: inv.

$0 = \frac{-b}{a}$

80%

90%

100%

%/00

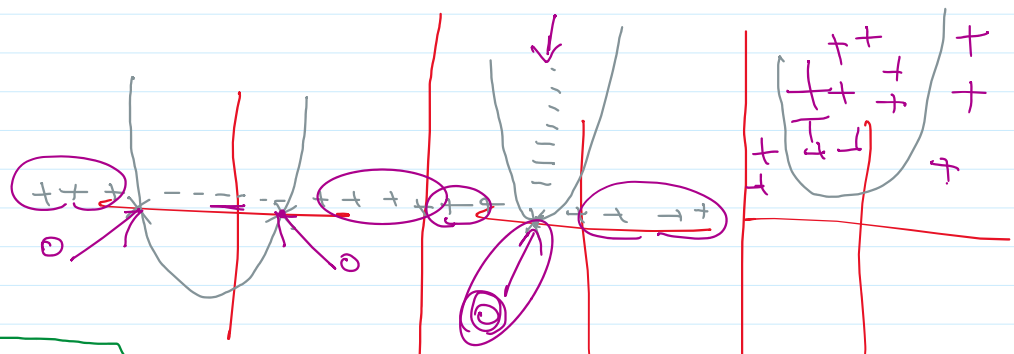
$(x^2 - 9) \to (x - 3)(x + 3)$

$x^2 - 9 = 0$ $x^2 = 9$ $\boxed{x = \pm 3}$

$(x^2 + 9) = 0$ $\sqrt{x^2} = \sqrt{-9}$

$\boxed{x = \pm 3i}$

$(x - 3i)(x + 3i)$



$b^2 - 4ac > 0$ $b^2 - 4ac = 0$ $b^2 - 4ac < 0$

X

sign + + + + + | − − − − | + + + +

X −2 1

$(x - 1)(x + 2) = 0$

$x - 1 = 0$ | $x + 2 = 0$

$x = 1$ | $x = -2$

sign − − − − | + + + + + | − − − − − −

x −3 3

$-x^2 + 9 = 0$

$\sqrt{x^2} = \sqrt{9}$ $\boxed{x = \pm 3}$