

First question 6 marks each item 1 mark

Choose the correct answer from those given :

- (1) The function $f: f(x) = -3$ is negative in
 (a) $]-\infty, -3[$ (b) $]-3, 3[$ (c) $]0, \infty[$ (d) $]-\infty, 0[$
- (2) The solution set of the inequality $x(x-2) \geq 0$ in \mathbb{R} is
 (a) $\{0, 2\}$ (b) $[0, 2]$ (c) $\mathbb{R} -]0, 2[$ (d) $\mathbb{R} -]0, 2[$
- (3) The simplest form of the imaginary number i^{52} is
 (a) i (b) $-i$ (c) 1 (d) -1
- (4) If one of the two roots of the equation : $aX^2 + 4X + 7 = 0$ is the multiplicative inverse of the other root , then $a =$
 (a) $\frac{1}{7}$ (b) 7 (c) 4 (d) -7
- (5) The sum of all integers belonging to the solution set of the inequality $(X-5)(3X-4) \leq 0$ is
 (a) 7 (b) 14 (c) 15 (d) 9
- (6) Which of the following is an imaginary number ?
 (a) π (b) $5-i$ (c) $\sqrt{-5}$ (d) i^2

Second question 4 marks [a] 2 marks [b] 2 marks

- [a] If $1 + i$ is one of the two roots of the equation : $X^2 - 2X + c = 0$ where $c \in \mathbb{R}$, find the other root , then find the value of c
- [b] Investigate the sign of the function $f: f(x) = 2X^2 + 7X - 15$ and from this find in \mathbb{R} the solution set of the inequality : $2X^2 + 7X \leq 15$

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$(+ve) =]-\infty, 2[\cup]3, \infty[$
 $= \mathbb{R} - [2, 3]$

$i^{52} = (i^4)^{13} = 1$

additive inverse

$L + M = -\frac{b}{a}$

$L = x$
 $M = -x$

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

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

multiplicative inverse

$LM = \frac{c}{a}$

$L = x$
 $M = \frac{1}{x}$

$x \cdot \frac{1}{x} = \frac{c}{a}$
 $1 = \frac{c}{a}$

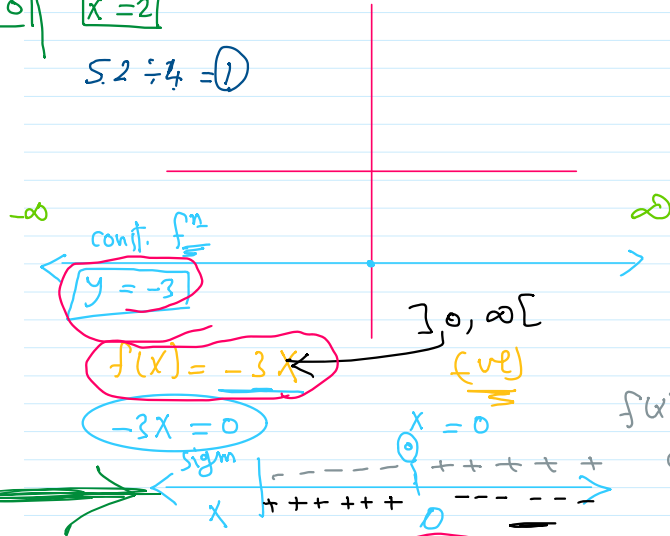
$c = 7$

$1 = \frac{7}{a}$
 $a = 7$

$a = - \quad b = - \quad c = -$

$f(x) = -3$ $y = -3$

$x(x-2) = 0$
 $x = 0 \quad x = 2$
 $52 \div 4 = 1$



$f(x) = x^2 - 5x + 6$ (+ve)

$x^2 - 5x + 6 = 0$
 $(x-2)(x-3) = 0$
 $x = 2 \quad x = 3$

