QUADRATIC INEQUALITIES

ANSWERS

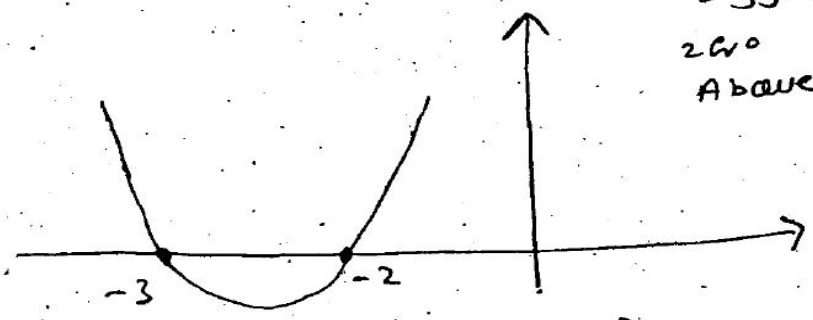
Q1

① $x^2 + 5x + 6 > 0$

$x^2 + 3x + 2x + 6$

$(x+3)(x+2)$

$x = -3 \quad , \quad x = -2$



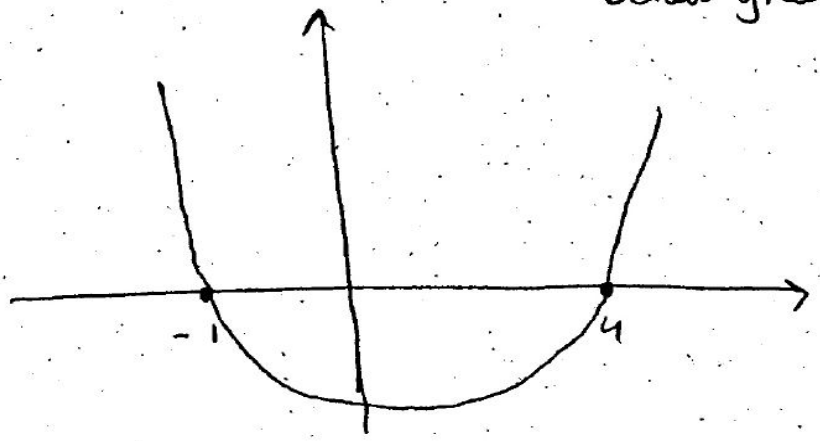
$x < -3$ or $x > -2$

Q2

② $x^2 - 3x - 4 < 0$

$(x-4)(x+1)$

$x = 4 \quad x = -1$



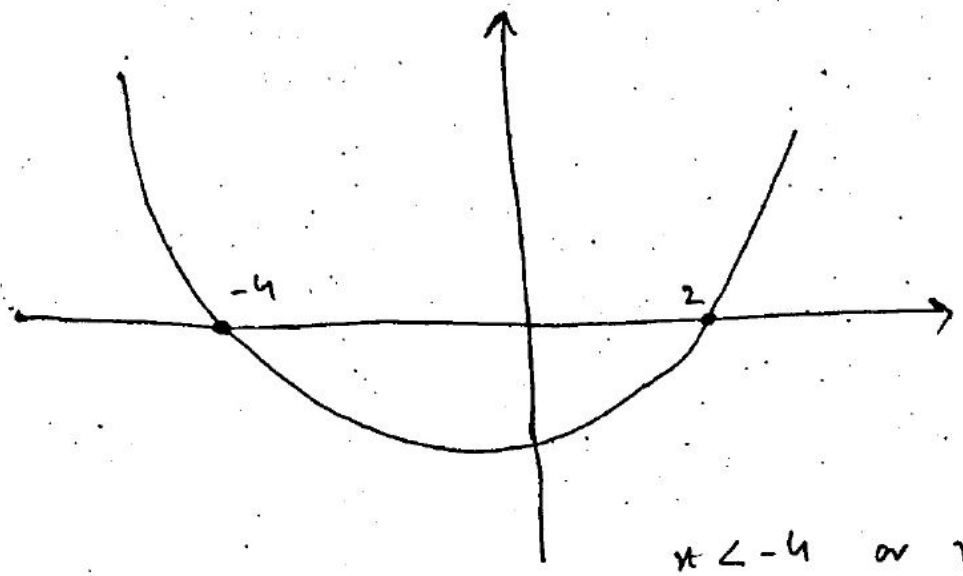
$-1 < x < 4$

Q3

(3) $x^2 + 2x - 8 > 0$

$(x+4)(x-2)$

$x = -4 \quad x = 2$



$x < -4$ or $x > 2$

Q4

(4) $x^2 - 7x + 12 < 0$

$(x-3)(x-4)$

$x = 3 \quad , \quad x = 4$

$3 < x < 4$

Q5

(5) $x^2 - 12x + 35 \leq 0$

$(x-7)(x-5) \leq 0 \quad \Rightarrow x = 7, x = 5$

$5 \leq 0 \leq 7$

Q6

(6) $x^2 - 2x - 15 \geq 0$

$(x-5)(x+3) \geq 0$

$x = 5 \quad x = -3$

$x \leq -3 \quad \text{OR} \quad x \geq 5$

Q7

(7) $x^2 \leq 25$

$x^2 - 25 \leq 0$

$(x+5)(x-5) \leq 0$

$x = -5 \quad \text{and} \quad x = 5$

$-5 \leq 0 \leq 5$

Q8

(8) $x^2 - 16 > 0$

$(x + 4)(x - 4) > 0$

$x = -4 \quad , x = 4$

$x < -4 \quad \text{OR} \quad x > 4$

Q9

(9) $x^2 > -2x + 8$

$x^2 - 2x + 8 > 0$

$(x + 4)(x - 2) > 0$

$x = -4 \quad x = 2$

$x < -4 \quad \text{OR} \quad x > 2$

Q10

(10) $3x^2 - 2x - 5 < 0$

$3x^2 + 3x - 5x - 5 < 0$

$3x(x+1) - 5(x+1) < 0$

$(3x-5)(x+1) < 0$

$x = \frac{5}{3}$ and $x = -1$

$-1 < x < \frac{5}{3}$

Q11

(11) $5x + 14 > x^2$

$0 > x^2 - 5x - 14$

$0 > (x-7)(x+2)$

$x = 7$, $x = -2$

$-2 < x < 7$

Q12

(12) $2x^2 - 7x - 4 < 0$

$(2x+1)(x-4)$

$x = -\frac{1}{2}$, $x = 4$

$-\frac{1}{2} < x < 4$

Q13

(13) $2x^2 - 10x + 4 < 0$

$x^2 - 5x + 2 < 0$

$a = 1$, $b = -5$, $c = 2$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(2)}}{2(1)}$$

$$= \frac{5 \pm 4.123}{2}$$

$\frac{5 + 4.123}{2}$, $\frac{5 - 4.123}{2}$

$= 4.561$, 0.4385

for 2 dp for 2 dp

$= 4.56$ 0.43

1 and 4

Q14

(14) $x^2 - 7x + 9 < 0$

$a = 1, \quad b = -7, \quad c = 9$

$$= \frac{-(-7) \pm \sqrt{(-7)^2 - 4(1)(9)}}{2(1)}$$

$$= \frac{7 \pm \sqrt{13}}{2}$$

$x = 5.30$ (2 dp) and $x = 1.70$ (2 dp)

Nearest integer are 2 and 5