COMPLETING THE SQUARE

ANSWERS

Q1

(1)

$x^2 - 8x + 1$

$(x-4)^2 - 16 + 1$

$(x-4)^2 - 15$

Turning points are

$(4, -15)$

Q2

(2)

$x^2 + 10x + 5$

$(x+5)^2 - 25 + 5$

$(x+5)^2 - 20$

Turning Points: $(-5, -20)$

Q3

(3) $x^2 + 4x + 2$

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

$(x+2)^2 - 2$

Turning Points: $(-2, -2)$

Q4

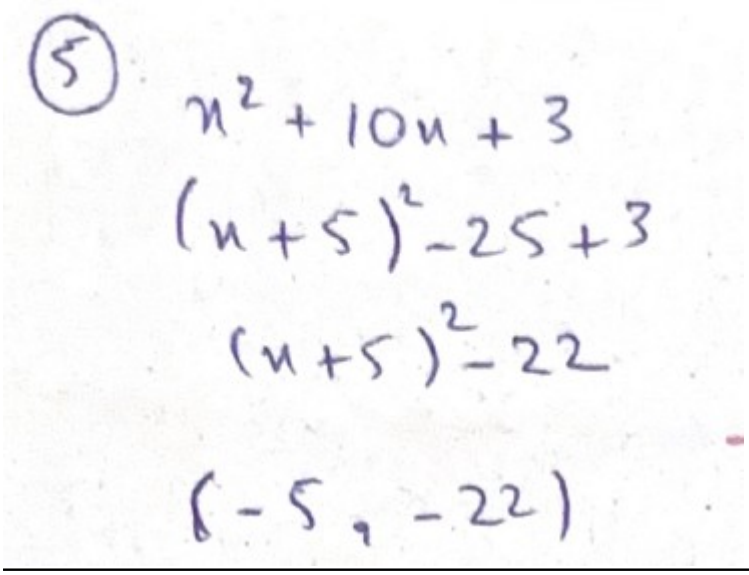
(4) $x^2 - 4x - 1$

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

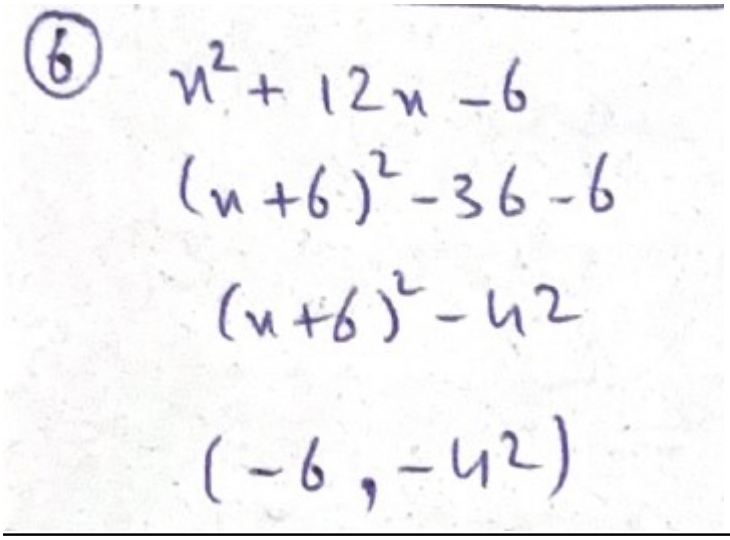
$(x-2) - 5$

Turning point: $(2, -5)$

Q5



Q6



Q7

(7) $x^2 + 3x - 9$

$(x + \frac{3}{2})^2 - \frac{9}{4} - 9$

$(x + \frac{3}{2})^2 - \frac{9}{4} - \frac{36}{4}$

$(x + \frac{3}{2})^2 - \frac{45}{4}$

$(-\frac{3}{2}, -\frac{45}{4})$

Q8

(8) $x^2 - x + 10$

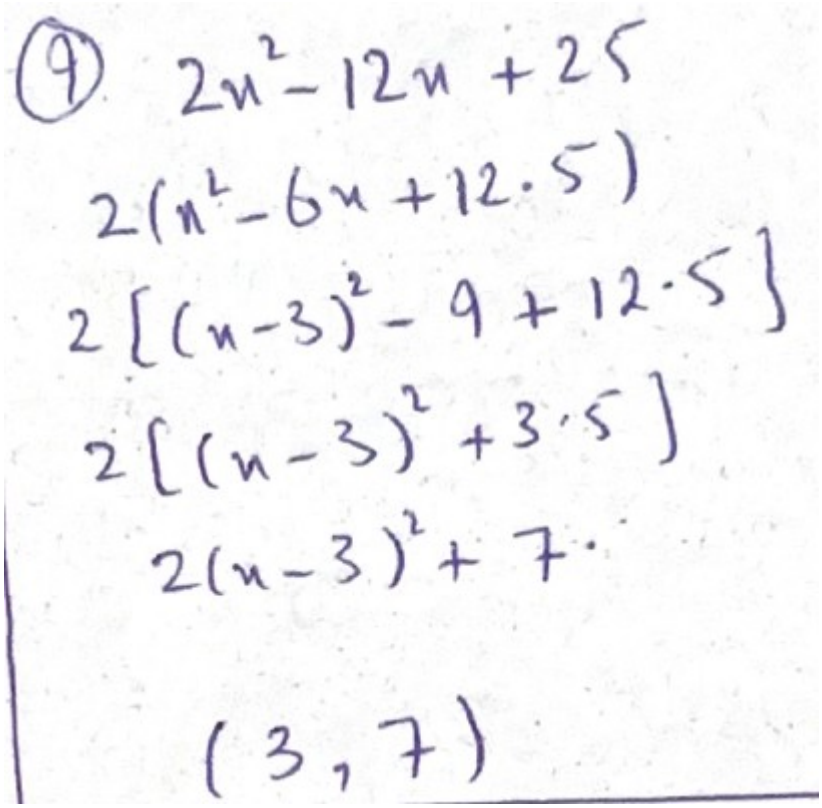
$(x - \frac{1}{2})^2 - \frac{1}{4} + 10$

$(x - \frac{1}{2})^2 - \frac{1}{4} + \frac{40}{4}$

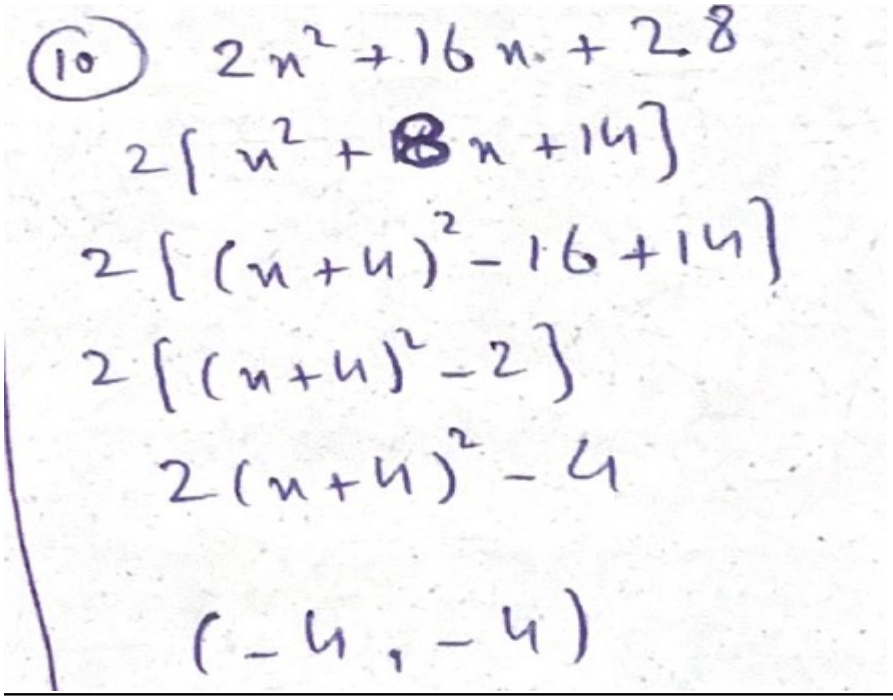
$(x - \frac{1}{2})^2 + \frac{39}{4}$

$(\frac{1}{2}, \frac{39}{4})$

Q9


(9) $2x^2 - 12x + 25$
$2(x^2 - 6x + 12.5)$
$2[(x-3)^2 - 9 + 12.5]$
$2[(x-3)^2 + 3.5]$
$2(x-3)^2 + 7$
(3, 7)

Q10


(10) $2x^2 + 16x + 28$
$2[x^2 + 8x + 14]$
$2[(x+4)^2 - 16 + 14]$
$2[(x+4)^2 - 2]$
$2(x+4)^2 - 4$
(-4, -4)

Q11

(11)

$3x^2 - 6x + 9$

$3(x^2 - 2x + 3)$

$3[(x-1)^2 - 1 + 3]$

$3[(x-1)^2 + 2]$

$3(x-1)^2 + 6$

$(1, 6)$

Q12

(12) $3x^2 - 30x + 66$

$3[x^2 - 10x + 22]$

$3[(x-5)^2 - 25 + 22]$

$3[(x-5)^2 - 3]$

$3(x-5)^2 - 9$

$(5, -9)$.

Q13

(13) $x^2 + 10x - 5$

$(x+5)^2 - 25 - 5$

$(x+5)^2 - 20 = 0$

$x + 5 = \pm\sqrt{20}$

$x = -5 \pm \sqrt{20}$

OR

$x = -5 \pm 2\sqrt{5}$

$x = -5 + 2\sqrt{5}$ OR $x = -5 - 2\sqrt{5}$