

Q(1)(a) $x^2 - 8x + 15$

lets assign our problem a value of 12

$$x^2 - 8x + 15 = 12^2 - 8(12) + 15$$

$$144 - 96 + 15 = 63$$

factorization of 63 is 9×7

Since $x = 12$,

$$7 = (x - 5) \quad \text{and} \quad 9 = (x - 3)$$

Upon multiplying $(x-5)(x-3) = x^2 - 8x + 15$

(b) $x^2 - 2x - 8$

lets pick 8

$$8^2 - 2(8) - 8 = 40$$

A factorization of 40 is 10×4

Since $x = 8$

$$(x+2) = 10 \quad \text{and} \quad x-4 = 4$$

(C) for $x = 7$

$$x^2 - 2x - 8$$

$$7^2 - 14 - 8 = 27$$

A factorization of 27 is 9×3

$$(x+2) = 9 \quad \text{and} \quad (x-4) = 3$$

Multiply to see if.

$$(x+2)(x-4) = x^2 - 2x - 8$$

- 2(a) The following steps are followed
- (i) Group the first two terms together and then the last two terms together
 - (ii) Factor out a GCF from each separate binomial.
 - (iii) Factor out the common binomial

$$b) \quad \underbrace{10ax - 5ay} + \underbrace{2bx - by}$$

$$5a(2x - y) + b(2x - y)$$

$$(5a + b)(2x - y)$$

$$(9) \quad 6x^3 + 3x^2y - 2xy - y^2$$

First way

(1) Grouping

$$\underbrace{6x^3 + 3x^2y}_{3x^2(2x+y)} - \underbrace{(2xy - y^2)}_{-y(2x+y)}$$

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

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

Second way

$$\begin{array}{r} 3x^2 - y \\ 2x+y \overline{) 6x^3 + 3x^2y - 2xy - y^2} \\ \underline{-(6x^3 + 3x^2y)} \\ 0 + 0 - 2xy - y^2 \\ \underline{-(-2xy + y^2)} \\ 0 0 \end{array}$$

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

Q(3)

$$x(9-x) = 14$$

$$9x - x^2 = 14$$

$$x^2 - 9x + 14 = 0$$

$$x^2 - 9x + \left(\frac{9}{2}\right)^2 + 14 = \left(\frac{9}{2}\right)^2$$

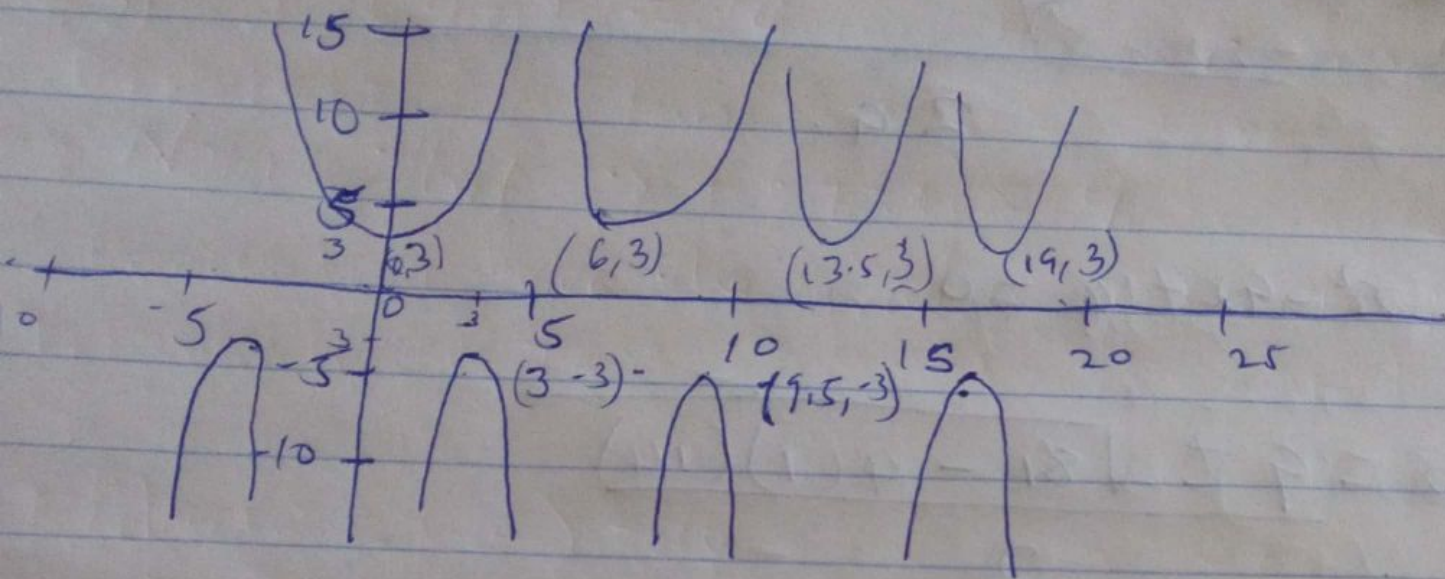
$$\left(x - \frac{9}{2}\right)^2 = \frac{81}{4} - \frac{56}{4}$$

$$\left(x - \frac{9}{2}\right)^2 = \frac{25}{4} \quad \text{Vertex} = \left(\frac{9}{2}, \frac{25}{4}\right)$$

(5) It's minimum since the quadratic coefficient is 170

The axis of symmetry is $x = \frac{9}{2}$.

(c) graphing.



(d) Completing square.

$$(1) \left(x - \frac{9}{2}\right) = 0 \pm \left(\frac{5}{2}\right)$$

$$x = \frac{9}{2} \pm \left(\frac{5}{2}\right)$$

$$x = \frac{14}{2} = 7 \quad \text{and} \quad x = \frac{4}{2} = 2$$

(11) you can also solve with the quadratic equation using

$$a = 1, b = -9, c = 14$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x^2 - 9x + 14 = 0$$

$$x = \frac{9 \pm \sqrt{81 - 4(1)(14)}}{2}$$

$$= \frac{9 \pm \sqrt{25}}{2}$$

$$= \frac{9 \pm 5}{2}$$

$$x = \frac{14}{2} = 7 \quad \text{or} \quad \frac{4}{2} = 2$$