3a) $Q(x) = P(x) + 34 - x^2$

$= 2x^2 - 16x + 30 + 34 - x^2$

$= x^2 - 16x + 64.$

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

Thus, $Q(x) = (x-8)^2$ where $a = 1$ & $b = -8$.

b) $Q(x) = 1$

$(x-8)^2 = 1$

$(x-8)^2 - 1 = 0$

$[x-8-1][x-8+1] = 0$

$(x-9)(x-7) = 0$

means $x-9=0$ or $x-7=0$

Thus, roots of given eqn are $x=9$ & $x=7$.

4) a) $F(x) = \dfrac{(x-8)^2}{(2x-16)(x+1)}$

$F(x)$ is defined for $(2x-16)(x+1) \neq 0$

means $2x-16 \neq 0$ and $x+1 \neq 0$

$x \neq 8$ & $x \neq -1$

Thus, $F(x)$ is defined for all real values of x except for $x = 8$ & $x = -1$.

$F(x) = \dfrac{(x-8)^2}{2(x-8)(x+1)}$

$= \dfrac{x-8}{2(x+1)}$

b) $F(x) = 2$

$\dfrac{x-8}{2(x+1)} = \dfrac{2}{1}$

$x - 8 = 4x + 4$

$3x = -12$

$x = -4$. which is accepted since it is included in domain of $F(x)$.