

$$2) Q(n) = 10n^2 - 7n + 1$$

$$(5n-1)(2n-1) = 10n^2 - 5n - 2n + 1 \\ = 10n^2 - 7n + 1$$

which is  $Q(n)$

thus,  $Q(n) = (5n-1)(2n-1)$  (shown).

$$3) E(n) = 8n^2 - 8n + 2 + (3-6n)(3n+2) - 5 + 20n^2 \\ = (\sqrt{8n})^2 - 2(\sqrt{8})(\sqrt{2})n + (\sqrt{2})^2 + (3-6n)(3n+2) + 5(4n^2+1) \\ = (2\sqrt{2}n - \sqrt{2})^2 + 3(2n-1)(3n+2) + 5(2n-1)(2n+1) \\ = 2(2n-1)^2 - 3(2n-1)(3n+2) + 5(2n-1)(2n+1) \\ = (2n-1)(4n-2-9n-6+10n+5) \\ = (2n-1)(5n-3) \text{ (written)}$$

4) a)  $M(x)$  is not defined when its lower part  $E(n) = 0$   
 so,  $(2n-1)(5n-3) = 0$   
 $n = \frac{1}{2}$  or  $n = \frac{3}{5}$

thus, for  $M(n)$  to be not defined,  $n = \frac{1}{2}$  or  $n = \frac{3}{5}$

b) the solution set of  $M(n)$  ~~are~~<sup>is</sup> any value of  $n$  except  $\frac{1}{2}$  and  $\frac{3}{5}$ , which are rational numbers,

and they are not natural nbs since natural nbs are nbs we can count with, so any other value of  $x$ , which include natural numbers are the solution of  $M(n)$ .  
 So, Hussein is right.

P.S.