

2(i)  $ax^2 + bx + c = 0$

$\therefore a, c$  have opposite signs

$\therefore ac$  is -ve

$$D = b^2 - 4ac$$

$$= b^2 - 4(-ve \text{ value})$$

$\therefore D > 0$

True

2(ii)  $ax^2 + bx + c = 0$

$a, c$  have same sign

$\therefore ac$  is +ve.

$$D = b^2 - 4ac$$

$$= 2 - 4(+ve \text{ value})$$

$D < 0$

$\therefore$  no real roots

③ False

$x^2 - 3 = 0$  has integral coeff. but roots are  $\pm\sqrt{3}$  which are not integral

④ yes

$x^2 - 3 = 0$  has integral coeff. but both roots are irrational ( $\pm\sqrt{3}$ )

⑤ yes

$\sqrt{7}x^2 + 2\sqrt{7}x - 3\sqrt{7} = 0$   
has rational roots  
1, -3

⑥ LHS =  $(0.2)^2 - 0.4$   
 $= 0.04 - 0.4$   
 $= -0.36$   
 $\neq 0$

$\therefore 0.2$  is not a root of  $x^2 - 0.4 = 0$

⑦ yes  $x^2 + bx + c = 0$   
if  $b = 0$   
 $x^2 + c = 0$

$\Rightarrow x^2 = -c$

$\Rightarrow x = \pm\sqrt{-c}$  [ -c is +ve as c is -ve ]