Ex 4.1

1. (i) $(x+1)^2 = 2(x-3)$

$x^2+1+x = 2x-6$

$x^2+x-2x+1+6 = 0$

$x^2-x+7 = 0$ (Yes)

(ii) $x^2-2x = -2(3-x)$

$x^2-2x = -6+2x$

$x^2-2x-2x+6 = 0$

$x^2-4x+6 = 0$ (Yes)

(iii) $(x-2)(x+1) = (x-1)(x+3)$

$x^2+x-2x-2 = x^2+3x-x-3$

$x^2-x-2 = x^2+2x-3$

$x^2-x^2-x-2x-2+3 = 0$

$-3x+1 = 0$ (No)

(iv) $(x-3)(2x+1) = x(x+5)$

$2x^2+x-6x-3 = x^2+5x$

$2x^2-x^2-5x-5x-3 = 0$

$x^2-10x-3 = 0$ (Yes)

(v) $(2x-1)(x-3) = (x+5)(x-1)$

$2x^2-6x-x+3 = x^2-x+5x-5$

$2x^2-x^2-7x+x-5x+3+5 = 0$

$x^2-11x+8 = 0$ (Yes)

(vi) $x^2+3x+1 = (x-2)^2$

$x^2+3x+1 = x^2+4-4x$ (NO)

(vii) $(x+2)^3 = 2x(x^2-1)$

$x^3+8+6x(x+2) = 2x^3-2x$

$x^3+8+6x^2+12x = 2x^3-2x$

$x^3-2x^3+6x^2+12x+2x+8 = 0$

$-x^3+6x^2+14x+8 = 0$ (NO)

(viii) $x^3-4x^2-x+1 = (x+2)^3$

$x^3-4x^2-x+1 = x^3+8+6x(x+2)$

$x^3-4x^2-x+1 = x^3+8+6x^2+12x$

$x^3-x^3-4x^2-6x^2-x-12x+1-8 = 0$

$-10x^2-13x-7 = 0$ (YES)

(i) Let the length be $= x$

Let the breadth be $= x+1$

Area $= lb = x(x+1)$

Area $= 528$

$(x)(x+1) = 528$

$(x)(x^2+1+x) = 528$

x^3

$(x)(2x+2) = 528$

$2x^2+2x = 528$

$2x^2+2x-528 = 0$

So, the quadratic equation formed is

(ii) let 1st number be = x
let 2nd number be = $x+1$

$(x)(x+1) = 306$
$x^2+x-306 = 0$ is the quadratic equation.
$x^2+(18-17)x-306$
$x^2+18x-17x-306$
$x(x+18)-17(x+18)$
$(x+18)(x-17)$
$x \neq -18$ or $x = 17$

(iii) let Rohan's age be = x
let Rohan's mother age be = $x+26$

$(x+3)(x+29) = 360$
$x^2+29x+3x+87 = 360$
$x^2+32x-273 = 0$ is the quadratic equation.

(iv) let the speed of the train be = x
new speed of train be = $x-8$

time take = $\frac{480}{x}$ new time = $\frac{480}{x-8}+3$

$\frac{480}{x-8} - \frac{480}{x} = 3$

$\frac{480x-480(x-8)}{x(x-8)} = 3$

$480x-480x+3840 = 3x^2-24x$
$3x^2-24x-3840 = 0$
$x^2-8x-1280 = 0$ is the quadratic equation