

$$\begin{aligned}
 1) & \sqrt{7}\sqrt{7}\sqrt{7}\dots\dots \\
 & = 7^{1/2} \cdot 7^{1/4} \cdot 7^{1/8} \cdot 7^{1/16} \dots\dots \\
 & = 7^{1/2+1/4+1/8+1/16\dots\dots} \\
 & = 7^{(1/2)/(1-1/2)} \\
 & = 7^1 \\
 & = 7
 \end{aligned}$$

$$\begin{aligned}
 2) & 7x^2 - 6y^2 = -11x^2 - 4y^2 \\
 & 18x^2 = 2y^2 \\
 & \frac{x^2}{y^2} = \frac{2}{18}
 \end{aligned}$$

$$\begin{aligned}
 3) & x+y=4 \\
 & x^2+y^2-4y=12 \\
 & x=4-y \\
 & 16+y^2-8y-4y+16+y^2=12 \\
 & y^2-12y+4=0 \\
 & 2y^2-12y+4=0 \\
 & 16+y^2-8y-4y+16+y^2 \\
 & 16+y^2-8y+y^2-4y=12 \\
 & 2y^2-12y+4=0 \\
 & y^2-6y+2=0 \\
 & y = \frac{6 \pm \sqrt{36-8}}{2}
 \end{aligned}$$

$$= \frac{6 \pm \sqrt{4\sqrt{83}}}{2}$$

$$= 3 \pm \sqrt{7}$$

$$x_1 = 4 - 3 - \sqrt{7}$$

$$= 1 - \sqrt{7}$$

$$x_2 = 4 - 3 + \sqrt{7}$$

$$= 1 + \sqrt{7}$$

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

$$i) x = 3.5$$

$$d = 2.5$$

$$ii) d = 2x^2 - 16x + 34 = 0$$

$$4x - 16 = 0$$

$$x = 4$$

$$d = 2(4)^2 - 16(4) + 34$$

$$= 32 - 64 + 34$$

$$= 2$$

$$iii) d = 100$$

$$100 = 2x^2 - 16x + 34$$

$$100 = 2(x^2 - 8x + 17)$$

$$50 = x^2 - 8x + 17$$

$$x^2 - 8x = 33$$

$$x^2 - 8x - 33 = 0$$

$$(x - 11)(x + 3) = 0$$

$$x = 11$$

$$5) \text{ Cost to rent car from Co. 1}$$

$$C_1 = 1500 + 25n$$

$$\text{Cost to rent car from Co. 2}$$

$$C_2 = 2100 + 22n$$

$$iii) C_2 < C_1$$

$$2100 + 22n < 1500 + 25n$$

$$iv) 3n > 600$$

$$n > 200$$

It is less expensive to take C_2 when the no. of kilometres is more than 200.