Maths Prepa MPSI Chap2 Ex

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Ex 1

1)
$$3^{n+2} - 3^{n+1} - 7 \times 3^n + 5 \times 3^{n-1}$$

$$3^{n+2} - 3^{n+1} = 3^{n+1}(3 - 1) = 2 \times 3^{n+1}$$

$$-7 \times 3^n = -7 \times \left(3^{n+1-1}\right) = \frac{-7}{3} \times 3^{n+1}$$

$$5 \times 3^{n-1} = 5 \times 3^{n+1-2} = \frac{5}{3^2} \times 3^{n+1}$$

$$3^{n+2} - 3^{n+1} - 7 \times 3^n + 5 \times 3^{n-1} = 3^{n+1}\left(2 - \frac{7}{3} + \frac{5}{3^2}\right) = 3^{n+1}\left(\frac{21 + 5 + 18}{3^2}\right) = 3^{n+1}\frac{44}{9}$$

Ex 8

$$\sqrt{x} + \sqrt{x + 1} = a$$

$$x + x + 1 = a^2$$

$$2x + 1 = a^2$$

$$x = \frac{a^2 - 1}{2}$$

$$x = \frac{a^2}{2} - \frac{1}{2}$$