

Lycee Des Arts

Correction Standards

$$1^{\text{st}} \text{ exercise } \Rightarrow A = \frac{2^n(3^{n+1} - 3^n)}{6^{n+1} - 6^n}$$

$$= \frac{2^n \times 3^n (3^1 - 1)}{6^n (6^1 - 1)}$$

$$A = \frac{6^n (2)}{6^n (5)}$$

$$\text{Thus } A = \frac{2}{5} \quad (C)$$

$$2) X = \frac{9^{11} + 9^{10} + 9^9}{3^{20} + 3^{19} + 3^{18}}$$

$$\frac{3^{22} + 3^{20} + 3^{18}}{3^{18} (3^2 + 3^1 + 1)}$$

$$X = \frac{3^{18} (3^4 + 3^2 + 1)}{3^{18} (3^2 + 3 + 1)}$$

$$X = \frac{81 + 10}{13}$$

$$X = \frac{91}{13} = 7$$

$$\begin{aligned} Y &= 4(2 + \sqrt{8})^2 (3 - 2\sqrt{2}) - 2 \\ &= 4(2 + 2\sqrt{2})^2 (3 - 2\sqrt{2}) - 2 \\ &= 4(4 + 8\sqrt{2} + 8)(3 - 2\sqrt{2}) - 2 \\ &= 4(12 + 8\sqrt{2})(3 - 2\sqrt{2}) - 2 \\ &= 4(4)(3 + 2\sqrt{2})(3 - 2\sqrt{2}) - 2 \\ &= 16[9 - 8] - 2 \\ &= 16(1) - 2 \\ &= 14 \end{aligned}$$

$$Y = 14 \quad \& \quad X = 7$$

$$\text{So, } \frac{X}{Y} = \frac{7}{14}$$

$$\frac{X}{Y} = \frac{1}{2}$$

$$\text{Thus, } \boxed{Y = 2X} \quad (A)$$

$$3) 3x\sqrt{2} = \sqrt{2} - 3x$$

$$3x\sqrt{2} + 3x = \sqrt{2}$$

$$3x(\sqrt{2} + 1) = \sqrt{2}$$

$$3x = \frac{\sqrt{2}}{(\sqrt{2} + 1)} \times \frac{(\sqrt{2} - 1)}{(\sqrt{2} - 1)}$$

$$3x = \frac{2 - \sqrt{2}}{2 - 1}$$

$$3x = \frac{2 - \sqrt{2}}{1}$$

$$\text{Thus, } \boxed{x = \frac{2 - \sqrt{2}}{3}} \quad (A)$$