■ A. Expand each of the following.

[1] $(a + b)^5$

[2] $(a - b)^5$

[3] $(1 - 2x)^5$

[4] $(x - y)^5$

[5] $(3x + y)^4$

[6] $\left(x + \frac{1}{x}\right)^6$

[7] $(3x + 2y)^3$

[8] $\left(1 - \sqrt{x}\right)^7$

■ B. Answer the following

[1] Write the first four terms of $(1 + x)^{12}$

[2] Find $(1.01)^{12}$ to three decimal places. Hint: $1.01 = (1 + .01)$

[3] Write the fifth term of $(a + b)^8$

[3] Write the third term of $(x + 3)^6$

[4] Write the fourth term in the expansion of $\left(\frac{1}{2} + \frac{1}{2}\right)^{10}$

[5] If h is small, show that $\frac{(a+h)^n - a^n}{h} \approx na^{n-1}$ (hint: experiment by trying a few values for n)

[Answers]

Binomial Thm

■ A. Expand each of the following.

[1] $a^5 + 5ba^4 + 10b^2a^3 + 10b^3a^2 + 5b^4a + b^5$

[2] $a^5 - 5ba^4 + 10b^2a^3 - 10b^3a^2 + 5b^4a - b^5$

[3] $-32x^5 + 80x^4 - 80x^3 + 40x^2 - 10x + 1$

[4] $x^5 - 5yx^4 + 10y^2x^3 - 10y^3x^2 + 5y^4x - y^5$

[5] $81x^4 + 108yx^3 + 54y^2x^2 + 12y^3x + y^4$

[6] $x^6 + 6x^4 + 15x^2 + 20 + \frac{15}{x^2} + \frac{6}{x^4} + \frac{1}{x^6}$

[7] $27x^3 + 54yx^2 + 36y^2x + 8y^3$

[8] $-x^{7/2} + 7x^3 - 21x^{5/2} + 35x^2 - 35x^{3/2} + 21x - 7\sqrt{x} + 1$

■ B. Answer the following

[1] $x^{12} + 12x^{11} + 66x^{10} + 220x^9$

[2] 1.127

[3] $70b^4a^4$

[3] $135x^4$

[4] 1

[5] If h is small, show that $\frac{(a+h)^n - a^n}{h} \approx na^{n-1}$ (hint: experiment by trying a few values for n)