

■ **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] $(x + \frac{1}{x})^6$

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

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

■ **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 $(\frac{1}{2} + \frac{1}{2})^{10}$

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

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

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

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

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

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

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

[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] $70 b^4 a^4$

[3] $135 x^4$

[4] 1

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