ANNOUNCEMENT:

The cut off to turn in any assignments with due dates of 11/15 or before is Friday by 2:30 pm

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WARMUP

ex: $(2x-5)^2 = 4x^2 - 20x + 25$

	$2x$	-5
$2x$	$4x^2$	$-10x$
-5	$-10x$	25

$$(4x+1)^2 = (4x+1)(4x+1)$$

$$= 16x^2 + 4x + 4x + 1 = 16x^2 + 8x + 1$$

$$(3x+4)^3 = (3x+4)\underbrace{(3x+4)(3x+4)}$$

$$= (3x+4)(9x^2 + 24x + 16)$$

	$9x^2$	$24x$	16
$3x$	$27x^3$	$72x^2$	$48x$
4	$36x^2$	$96x$	64

$$= 27x^3 + 108x^2 + 144x + 64$$

$$\lim_{h \to 0} \frac{(x+h)^5 - x^5}{h}$$

Section 11.5 The Binomial Theorem

Pascal's Triangle

1

1 1

1 2 1

1 3 3 1

→ 1 4 6 4 1

$$\begin{array}{ccccccc} & 1 & 5 & 10 & 10 & 5 & 1 \\ 1 & 6 & 15 & 20 & 15 & 6 & 1 \end{array}$$

ex: $(\underline{3x} + \underline{2})^4 = 1(3x)^4 \cdot 2^0 + 4(3x)^3 \cdot 2^1 + 6(3x)^2 \cdot 2^2 + 4(3x)^1 2^3 + 1(3x)^0 \cdot 2^4$

$= 1 \cdot 81x^4 \cdot 1 + 4 \cdot 27x^3 \cdot 2 + 6 \cdot 9x^2 \cdot 4 + 4 \cdot 3x \cdot 8 + 1 \cdot 1 \cdot 16$

$= 81x^4 + 216x^3 + 216x^2 + 96x + 16$

Your turn: $(5x+3)^3 = 1(5x)^3 \cdot 3^0 + 3(5x)^2 \cdot 3^1 + 3(5x)^1 \cdot 3^2 + 1(5x)^0 \cdot 3^3$

$= 1 \cdot 125x^3 \cdot 1 + 3 \cdot 25x^2 \cdot 3 + 3 \cdot 5x \cdot 9 + 1 \cdot 1 \cdot 27$

$= 125x^3 + 225x^2 + 135x + 27$

$(4x - y)^5 = (4x + (-y))^5$

$= 1(4x)^5(-y)^0 + 5(4x)^4(-y)^1 + 10(4x)^3(-y)^2 + 10(4x)^2(-y)^3 + 5(4x)^1(-y)^4 + 1(4x)^0(-y)^5$

$= 1 \cdot 1024x^5 \cdot 1 + 5 \cdot 256x^4(-y) + 10 \cdot 64x^3y^2 + 10 \cdot 16x^2(-y^3) + 5 \cdot 4xy^4 + 1 \cdot 1(-y^5)$

$= 1024x^5 - 1280x^4y + 640x^3y^2 - 160x^2y^3 + 20xy^4 - y^5$

p895 Use binomial theorem

15, 17, 18, 23