

Name _____

Date _____ Period _____

Rewrite the following polynomials into standard form. Give the LC, degree, and classify each polynomial.

1) $3x - 5x^2 + 7 - 10x^3$
 $-10x^3 - 5x^2 + 3x + 7$

LC: -10 D: 3

Cubic polynomial

2) $6x^5 - 2 - 4x + x^5$

$7x^5 - 4x - 2$

LC: 7 D: 5

quintic trinomial

Write the sum, difference, or product of the following polynomials in standard form.

3) $(x^5 - 4x^4 + 1) - (-7x^4 + 11)$

$x^5 + 3x^4 - 10$

4) $(-x^7 - 2x^2 + 6x^3 - 4 - x^4) + (4x - 6x^3 + 4x^7 + 4) - (6x^2 + 9x^4)$

$3x^7 - 10x^4 - 8x^2 + 4x$

5) $(3a^2b + 3ab^2)(4a^2b - 9ab^2)$

$12a^4b^2 - 27a^3b^3 + 12a^3b^3 - 27a^2b^4$

$12a^4b^2 - 15a^3b^3 - 27a^2b^4$

6) $(2x - 7)(x^2 - x + 11)$

	x^2	$-x$	$+11$
$2x$	$2x^3$	$-2x^2$	$22x$
-7	$-7x^2$	$7x$	-77

$2x^3 - 9x^2 + 29x - 77$

7) $-(7x - 9)^2$

$-(7x - 9)(7x - 9)$
 $(-7x + 9)(7x - 9)$

$-49x^2 + 63x + 63x - 81$

$-49x^2 + 126x - 81$

8) $(x + 9)^2(3x - 1)^2$

$(x + 9)(x + 9)(3x - 1)(3x - 1)$

$(x^2 + 18x + 81)(9x^2 - 6x + 1)$

	x^2	$9x^4$	$-6x^3$	x^2
$18x$	$162x^3$	$-108x^2$	$18x$	
81	$729x^2$	$-486x$	81	

$9x^4 + 156x^3 + 622x^2 + 468x + 81$

9) What polynomial could you add to $3x^4 - 9x^3 + 5x^2 - x + 7$ to get a sum of $3 + 4x^4 + 3x - x^3 + 3x^2$?

$(4x^4 - x^3 + 3x^2 + 3x + 3) - (3x^4 - 9x^3 + 5x^2 - x + 7)$

$x^4 + 8x^3 - 2x^2 + 4x - 4$

10) What polynomial could you subtract from $5x^3 - 12x - x^2 + 9 - 12x^5 - 6x^4$ to get a difference of

$19 + 8x^3 - 18x - 19x^5 - 2x^2 - 8x^4$?

$(-12x^5 - 6x^4 + 5x^3 - x^2 - 12x + 9) - (-19x^5 - 8x^4 + 8x^3 - 2x^2 - 18x + 19)$

$7x^5 + 2x^4 - 3x^3 + x^2 + 6x - 10$

Expand using Pascal's Triangle

$$11) (3x - 5y)^4$$

1	$(3x)^4$	$(5y)^0$
4	$(3x)^3$	$(5y)^1$
6	$(3x)^2$	$(5y)^2$
4	$(3x)^1$	$(5y)^3$
1	$(3x)^0$	$(5y)^4$

$$12) (x + 6)^5$$

1	x^5	6^0
5	x^4	6^1
10	x^3	6^2
10	x^2	6^3
5	x^1	6^4
1	x^0	6^5

$$81x^4 - 540x^3y + 1350x^2y^2 - 1500xy^3 + 625y^4$$

$$x^5 + 30x^4 + 360x^3 + 2160x^2 + 640x + 7776$$

Find the following binomial probabilities.

13) An agent sells life insurance policies to five equally aged, healthy people. According to recent data, the probability of a person living in these conditions for 30 years or more is $2/3$. Calculate the probability that after 30 years 4 or 5 people are still living.

$$n=5 \quad P(4) = {}_5C_4 (2/3)^4 (1/3)^1 = .329$$

$$r=4, 5 \quad P(5) = {}_5C_5 (2/3)^5 (1/3)^0 = .132$$

$$p=2/3 \quad q=1/3 \quad \boxed{.461}$$

14) A pharmaceutical lab states that a drug causes negative side effects in 3 of every 100 patients. To confirm this affirmation, another laboratory chooses 5 people at random who have consumed the drug. What is the probability that exactly 2 people experience side effects?

$$n=5 \quad P(2) = {}_5C_2 (.03)^2 (.97)^3 = \boxed{.008}$$

$$r=2 \quad p=.03 \quad q=.97$$

15) A farmer plants 12 saplings. On average, 15% of saplings planted fail to survive their first winter. Find the probability that more than one of his saplings will die in that first winter

$$n=12 \quad P(0) = {}_{12}C_0 (.15)^0 (.85)^{12} = .142 \quad 1 - .443 =$$

$$r > 1 \quad P(1) = {}_{12}C_1 (.15)^1 (.85)^{11} = \frac{.301}{.443} \quad \boxed{.557}$$

$$p=.15 \quad q=.85$$

16) There were ten green bottles sitting on the wall. The probability of a green bottle accidentally falling is 0.05. What is the probability that fewer than 3 of the green bottles accidentally fall?

$$n=10 \quad P(0) = {}_{10}C_0 (.95)^0 (.05)^{10} = .00000000000977$$

$$r < 3 \quad P(1) = {}_{10}C_1 (.95)^1 (.05)^9 = .000000000019$$

$$p=.05 \quad q=.95 \quad P(2) = {}_{10}C_2 (.95)^2 (.05)^8 = .000000002 = \boxed{.000000002}$$

17) At Buford High School, 4 in 7 students is on a sports team. There are 4 student council representatives in the school. a. What is the probability that 2 of the student council representatives are also on a sports team?

$$n=4 \quad P(2) = {}_4C_2 (4/7)^2 (3/7)^2$$

$$r=2 \quad = \boxed{.36}$$

$$p=4/7 \quad q=3/7$$