

#3 ClassWork Polynomials & Factoring

Name _____/1/_____/15

Identify the DEGREE of each monomial.

1A) $-7x$ 1	2A) m^3n^2p 6	3) $4x^2y^3$ 5	2B) 13 0
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Rewrite in STANDARD FORM (SF), identify the leading coefficient, degree and number of terms. Name the polynomial.

3A) $4x + 2x^2 - 7 + x^3$ SF: $x^3 + 2x^2 + 4x - 7$ LC: <u>1</u> Degree: <u>3</u> # Terms: <u>4</u> Name: <u>Cubic Poly</u>	4A) $5x^2 - 4x^3$ SF: $-4x^3 + 5x^2$ LC: <u>-4</u> Degree: <u>3</u> # Terms: <u>2</u> Name: <u>Cubic binomial</u>	5B) $3x^2 - 4 + 5x^3$ SF: $5x^3 + 3x^2 - 4$ LC: <u>5</u> Degree: <u>3</u> # Terms: <u>3</u> Name: <u>Cubic trinomial</u>	4B) $4x^4 + 8x^2 + 1 - 3x$ SF: $4x^4 + 8x^2 - 3x + 1$ LC: <u>4</u> Degree: <u>4</u> # Terms: <u>4</u> Name: <u>Quartic Poly</u>
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Add or Subtract. Write answers in STANDARD FORM.

5A) $(15x^2 - 3x + 11) + (2x^3 - x^2 + 6x + 1)$ $2x^3 + 14x^2 + 3x + 12$	5B) $12x - 1 + 2x^2 + (x^2 + 4)$ $3x^2 + 12x + 3$
6A) $(3x^2 - 5x) + (-4 + x^2 - x)$ $+4 - x^2 + x$ $2x^2 - 4x + 4$	6B) $(x^2 - 3x + 7) - (6x^2 - 4x + 12)$ $-6x^2 + 4x - 12$ $-5x^2 + 1x - 5$

Find each product.

7A) $7x^3(2x + 3)$ $14x^4 + 21x^3$	8A) $-4x^2y^3(5xy^2 + 3x^2y^3)$ $-20x^3y^5 + -12x^4y^6$	7B) $-3x^2(2x^2 - 3x + 1)$ $-6x^4 + 9x^3 - 3x^2$	8B) $7x^3y^2(6xy^2 - 5x^3y^4)$ $42x^4y^4 - 35x^6y^6$
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9A) $(x - 2)(3x^2 - 5x + 7)$ x - 2 <table border="1" style="display: inline-table;"> <tr> <td>$3x^2$</td> <td>$3x^3$</td> <td>$-6x^2$</td> </tr> <tr> <td>$-5x$</td> <td>$-5x^2$</td> <td>$10x$</td> </tr> <tr> <td>$+7$</td> <td>$7x$</td> <td>-14</td> </tr> </table> $3x^3 - 11x^2 + 17x - 14$	$3x^2$	$3x^3$	$-6x^2$	$-5x$	$-5x^2$	$10x$	$+7$	$7x$	-14	9B) $(2x - 3)(3x^2 + 2x - 1)$ $6x^3 + 4x^2 - 2x - 9x^2 - 6x + 3$ $6x^3 - 5x^2 - 8x + 3$
$3x^2$	$3x^3$	$-6x^2$								
$-5x$	$-5x^2$	$10x$								
$+7$	$7x$	-14								

10B) $(3x+2)^3$

$(3x+2)(3x+2)(3x+2)$

$9x^2+6x+6x+4$

$(9x^2+12x+4)(3x+2)$

$27x^3+36x^2+12x+19x^2+24x+8$

$27x^3+54x^2+36x+8$

10A) $(2x-5)^3$

$(2x-5)(2x-5)(2x-5)$

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

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

$8x^3-40x^2+50x-20x^2+100x-125$

$8x^3-60x^2+150x-125$

Graph each polynomial function on a calculator. Sketch the graph, then describe the graph and identify the number of real zeros.

11B) $f(x) = 4x^3 - 5x + 1$

inc, dec, inc

3 real roots

11A) $g(x) = \frac{1}{4}x^4 - 3x^2$

it dec. then inc. then dec. and finally inc

3 roots

Factor Each expression completely.

12B) $2x^3 - 10x^2 + 3x - 15$

$2x^2(x-5)3(x-5)$

$(2x^2+3)(x-5)$

12A) $\frac{3x^2}{x-2}(3x^3-6x^2) + (x-2) \boxed{(3x^2+1)(x-2)}$

it inc. then dec. then inc.

1 real root

13B) $x^3 + x^2 - x - 1$

$x^2(x+1) - 1(x+1)$

$(x^2-1)(x+1)$

$(x+1)(x-1)(x+1)$

13A) $\frac{(x^3+5x^2)(-4x-20)}{x^2(x+5)-4(x+5)} \frac{(x^2-4)(x+5)}{(x+2)(x-2)(x+5)}$

it inc then dec and inc.

3 real roots

14B) $x^3 + 64$
 $(x)^3 (4)^3 (x+4)(x^2-4x+16)$

14A) $x^3 - 125$
 $x \cdot x \cdot x \quad 5 \cdot 5 \cdot 5 \quad \boxed{(x-5)(x^2+5x+25)}$

inc only

1 real root

15B) $8x^3 - 1$
 $(2x)^3 (1)^3 (2x-1)(4x^2+2x+1)$

15A) $27x^3 + 8$
 $3x \quad 2 \quad \boxed{(3x+2)(9x^2-6x+4)}$

inc only

1 real root