

Name: _____

Date: _____

Use the following to review for you test. Work the practice problems on a separate sheet of paper.

What you need to know & be able to do	Things to remember	Problem	Problem
<p>Classify Polynomials</p>	<ul style="list-style-type: none"> Write all answers in Standard Form <ul style="list-style-type: none"> Highest Exp to Lowest Classify Polynomials based on Degree and # terms Leading Coeff – First coeff in standard form Constant – Term without a variable 	<p>1. List all the names for: Degree: 0 - <u>Constant</u> 1 - <u>linear</u> 2 - <u>quadratic</u> 3 - <u>cubic</u> 4 - <u>quartic</u> 5 - <u>quintic</u></p> <p>Number of terms: 1 - <u>monomial</u> 2 - <u>binomial</u> 3 - <u>trinomial</u> 4 - <u>Polynomial</u></p>	<p>2. $f(x) = x + 2 - x^2 - 4x^4$</p> <p>standard form: <u>$-4x^4 - x^2 + x + 2$</u> leading coefficient: <u>-4</u> constant: <u>2</u> name by degree: <u>Quartic</u> name by # terms: <u>Polynomial</u></p>
<p>Adding and Subtracting</p>	<p>Adding:</p> <ul style="list-style-type: none"> Combine like terms <p>Subtracting:</p> <ul style="list-style-type: none"> Distribute the negative Combine like terms 	<p>3. $(3x^2 + 7 + x) + (14x^3 + 2 + x^2 - x)$</p> <p><u>$14x^3 + 4x^2 + 9$</u></p>	<p>4. $(1 - x^2) - (3x^2 + 2x - 5)$</p> <p>$1 - x^2 - 3x^2 - 2x + 5$</p> <p><u>$-4x^2 - 2x + 6$</u></p>
<p>Multiply Polynomials</p>	<ul style="list-style-type: none"> Distribute every term Box Method Multiply numbers, add exponents Answers in standard form 	<p>5. $(3 + x)(2x^2 + 9x - 6)$</p> <p><u>$2x^3 + 15x^2 + 21x - 18$</u></p>	<p>6. $(x - y)(x^2 - xy + y^2)$</p> <p><u>$x^3 - 2x^2y + 2xy^2 - y^3$</u></p>
<p>Binomial Expansion</p>	<ul style="list-style-type: none"> Know Pascal's Triangle Answers must be in standard form 	<p>7. $(x - 3y)^4$</p> <p>$1(x)^4(-3y)^0 = x^4 = x^4$ $4(x)^3(-3y)^1 = 4x^3(-3y) = -12x^3y$ $6(x)^2(-3y)^2 = 6x^2(9y^2) = 54x^2y^2$ $4(x)^1(-3y)^3 = 4x(-27y^3) = -108xy^3$ $1(x)^0(-3y)^4 = 81y^4 = 81y^4$</p> <p><u>$x^4 - 12x^3y + 54x^2y^2 - 108xy^3 + 81y^4$</u></p>	<p>8. $(4x + 5)^3$</p> <p>$1(4x)^3(5)^0 = 64x^3$ $3(4x)^2(5)^1 = 3(16x^2)(5) = 240x^2$ $3(4x)^1(5)^2 = 3(4x)(25) = 300x$ $1(4x)^0(5)^3 = 125$</p> <p><u>$64x^3 + 240x^2 + 300x + 125$</u></p>

<p>Binomial Expansion with Imaginary Numbers</p>	<ul style="list-style-type: none"> • Know "i" chart • Convert "i" to simplest form • Add real terms together • Add imaginary terms together • Answers must be in standard form a+bi 	<p>8. $(3+2i)^3$</p> $1(3)^3(2i)^0 = 27 = 27 = 27$ $3(3)^2(2i)^1 = 3(9)(2i) = 54i = 54i$ $3(3)^1(2i)^2 = 3(3)(4i^2) = 3(3)(-4) = -36$ $1(3)^0(2i)^3 = 8i^3 = -8i$ $27 + 54i - 36 - 8i$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $-9 + 46i$ </div>	<p>9. $(i-4)^4$</p> $1i^4(-4)^0 = i^4 = i^4$ $4i^3(-4)^1 = 4i^3(-4) = -16i^3$ $6i^2(-4)^2 = 6i^2(16) = 96i^2$ $4i^1(-4)^3 = 4i(-64) = -256i$ $1i^0(-4)^4 = 256 = 256$ $1 + 16i - 96 - 256i + 256$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $161 - 240i$ </div>
<p>Dividing Polynomials <i>(topic cont'd on next page)</i></p>	<p>Missing terms need "0"</p> <p><u>Synthetic Division</u></p> <ul style="list-style-type: none"> • Use when divisor is degree of one • Solve divisor • Use coefficients of dividend • Answer degree is one less <p><u>Long Division</u></p> <ul style="list-style-type: none"> • Use when divisor's degree is not one • Negate the sign when multiply down • Bring Down next term 	<p>10. $(x^4 - 3x^3 - 7x - 14) \div (x - 4)$</p> $\begin{array}{r rrrrr} 4 & 1 & -3 & 0 & -7 & -14 \\ & \downarrow & 4 & 4 & 16 & 36 \\ \hline & 1 & 1 & 4 & 9 & 22 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $x^3 + x^2 + 4x + 9 + \frac{22}{x-4}$ </div> <p>13. $x^4 + 2x^2 - 2 \div x^2 + 3$</p> $\begin{array}{r} x^2 - 1 \\ x^2 + 0x + 3 \overline{) x^4 + 0x^3 + 2x^2 + 0x - 2} \\ \underline{-x^4 + 0x^3 + 3x^2} \\ -x^2 + 0x - 2 \\ \underline{+x^2 + 0x + 3} \\ 1 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $x^2 - 1 + \frac{1}{x^2 + 3}$ </div> <p>14. $(4x^2 + 5x + 1) \div (x + 1)$</p> $\begin{array}{r} -1 \ 4 \ 5 \ 1 \\ \downarrow -4 \ -1 \\ \hline 4 \ 1 \ 0 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $4x + 1$ </div>	<p>12. $(8x^4 + 2x^2 - 12x + 9) \div (x^2 + x - 3)$</p> $\begin{array}{r} 8x^2 - 8x + 34 \\ x^2 + x - 3 \overline{) 8x^4 + 0x^3 + 2x^2 - 12x + 9} \\ \underline{-8x^4 + 8x^3 + 24x^2} \\ -8x^3 + 2x^2 - 12x + 9 \\ \underline{+8x^3 + 8x^2 - 24x} \\ -70x + 111 \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $8x^2 - 8x + 34 + \frac{-70x + 111}{x^2 + x - 3}$ </div>
<p>Imaginary and Complex Numbers</p>	<p>Add and Subtract</p>	<p>15. $i(8+2i) - 4i(10-3i)$</p> $8i + 2i^2 - 40i + 12i^2$ $8i + 2(-1) - 40i + 12(-1)$ $8i - 2 - 40i - 12$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $-14 - 32i$ </div> <p>17. $(2-3i)^2$</p> $(2-3i)(2-3i)$ $4 - 6i - 6i + 9i^2$ $4 - 12i - 9$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $-5 - 12i$ </div>	<p>16. $2i^{14} - 5i^7 + 3i^2 - 4$</p> $\frac{14}{4} = 3.5 \quad \frac{7}{4} = 1.75$ $2(-1) - 5(-i) + 3(-1) - 4$ $-2 + 5i - 3 - 4$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $-9 + 5i$ </div> <p>18. $(2+i)(3-i) - 4(i-1)$</p> $6 - 2i + 3i - i^2 - 4i + 4$ $10 - 3i + 1$ <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $11 - 3i$ </div>