

Name: \_\_\_\_\_ Block: \_\_\_\_\_ Date: \_\_\_\_\_

**Chapter 5 Extra Credit Assignment**

\*\*\*You MUST Show ALL work or NO credit\*\*\*

___1.	Which polynomial function has an end behavior of up and down? <input type="radio"/> (F) $-6x^7 + 4x^2 - 3$ <input type="radio"/> (H) $6x^7 - 4x^2 + 3$ <input type="radio"/> (G) $-7x^6 + 3x - 2$ <input type="radio"/> (I) $7x^6 - 3x + 2$
___2.	What is the number of terms in the polynomial $(2a - 5)(a^2 - 1)$ ? <input type="radio"/> (A) 2 <input type="radio"/> (B) 3 <input type="radio"/> (C) 4 <input type="radio"/> (D) 5
___3.	What is the factored form of $2x^3 + 5x^2 - 12x$ ? <input type="radio"/> (F) $(x + 4)(2x - 3)$ <input type="radio"/> (H) $x(x + 4)(2x - 3)$ <input type="radio"/> (G) $(x - 4)(2x + 3)$ <input type="radio"/> (I) $x(x - 4)(2x + 3)$
___4.	Which is the cubic polynomial in standard form with roots 3, -6, and 0? <input type="radio"/> (A) $x^2 - 3x - 18$ <input type="radio"/> (C) $x^3 - 3x^2 - 18x$ <input type="radio"/> (B) $x^2 + 3x - 18$ <input type="radio"/> (D) $x^3 + 3x^2 - 18x$
___5.	Your brother is 3 years older than you. Your sister is 4 years younger than you. The product of your ages is 1872. How old is your sister? <input type="radio"/> (A) 9 years <input type="radio"/> (B) 13 years <input type="radio"/> (C) 16 years <input type="radio"/> (D) 17 years
___6.	What are the real roots of $x^3 + 8 = 0$ ? <input type="radio"/> (F) 2 <input type="radio"/> (G) -2 <input type="radio"/> (H) $-2 \pm \sqrt{3}$ <input type="radio"/> (I) $-2 \pm \sqrt{5}$
___7.	A fourth-degree polynomial with integer coefficients has roots at 1 and $3 + \sqrt{5}$ . Which number <i>cannot</i> also be a root of this polynomial? <input type="radio"/> (A) -1 <input type="radio"/> (B) -3 <input type="radio"/> (C) $3 - \sqrt{5}$ <input type="radio"/> (D) $3 + \sqrt{2}$

___8.	<p>What is a quartic polynomial function with rational coefficients that has roots <math>i</math> and <math>2i</math>?</p> <p>Ⓐ <math>x^4 - 5x^2 - 4</math>    Ⓑ <math>x^4 - 5x^2 + 4</math>    Ⓒ <math>x^4 + 5x^2 + 4</math>    Ⓓ <math>x^4 + 5x^2 - 4</math></p>
___9.	<p>What does Descartes' Rule of Signs tell you about the real roots of <math>6x^4 + 29x^3 + 40x^2 + 7x - 12</math>?</p> <p>Ⓕ 1 positive real root and 1 or 3 negative real roots</p> <p>Ⓖ 0 positive real roots and 1 negative real root</p> <p>Ⓗ 1 or 3 positive real roots and 1 negative real root</p> <p>Ⓘ 0 or 1 positive real roots and 3 negative real roots</p>
___10.	<p>One root of the equation <math>x^3 + x^2 - 2 = 0</math> is 1. What are the other two roots?</p> <p>Ⓕ <math>-1 \pm i</math>    Ⓖ <math>1 \pm 2i</math>    Ⓗ <math>\pm 1 + 2i</math>    Ⓘ <math>\pm 1 - i</math></p>
___11.	<p>A polynomial with real coefficients has 3, <math>2i</math>, and <math>-i</math> as three of its zeros. What is the least possible degree of the polynomial?</p> <p>Ⓐ 3    Ⓑ 4    Ⓒ 5    Ⓓ 6</p>
___12.	<p>Which of the following is the polynomial with zeros at 1, <math>-\frac{3}{2}</math>, <math>2i</math>, and <math>-2i</math>?</p> <p>Ⓐ <math>2x^4 + x^3 + 5x^2 + 4x - 12</math>    Ⓒ <math>2x^4 + x^3 - 11x^2 - 4x + 12</math></p> <p>Ⓑ <math>2x^4 - x^3 + 5x^2 - 4x - 12</math>    Ⓓ <math>2x^4 - x^3 - 11x^2 + 4x + 12</math></p>
___13.	<p>A polynomial with real coefficients has roots of 6, <math>-2</math>, <math>-4i</math>, and <math>\sqrt{5}</math>. Which of the following <i>must</i> be another root of this polynomial?</p> <p>Ⓕ <math>-6</math>    Ⓖ <math>-\sqrt{5}</math>    Ⓗ 2    Ⓘ <math>4i</math></p>
___14.	<p>What is the expanded form of <math>(a - b)^3</math>?</p> <p>Ⓐ <math>a^3 + a^2b + ab^2 + b^3</math>    Ⓒ <math>a^3 + 3a^2b + 3ab^2 + b^3</math></p> <p>Ⓑ <math>a^3 - a^2b + ab^2 - b^3</math>    Ⓓ <math>a^3 - 3a^2b + 3ab^2 - b^3</math></p>
___15.	<p>What is the third term in the expansion of <math>(x - y)^7</math>?</p> <p>Ⓕ <math>21x^5y^2</math>    Ⓖ <math>-7x^6y</math>    Ⓗ <math>7x^6y</math>    Ⓘ <math>-21x^5y^2</math></p>

___16.	What is the coefficient of the third term in the expansion of $(2x - y)^5$ ? <input type="radio"/> (A) -80 <input type="radio"/> (B) 32 <input type="radio"/> (C) 40 <input type="radio"/> (D) 80
___17.	What is $n$ if $-448x^5y^3$ appears in the expansion of $(x - 2y)^n$ ? <input type="radio"/> (A) 6 <input type="radio"/> (B) 7 <input type="radio"/> (C) 8 <input type="radio"/> (D) 9
___18.	What is the expanded form of $(2x - y)^5$ ? <input type="radio"/> (A) $32x^5 + 80x^4y + 80x^3y^2 + 40x^2y^3 + 10xy^4 + y^5$ <input type="radio"/> (B) $32x^5 - 80x^4y + 80x^3y^2 - 40x^2y^3 + 10xy^4 - y^5$ <input type="radio"/> (C) $2x^5 + 5x^4y + 20x^3y^2 + 20x^2y^3 + 10xy^4 + y^5$ <input type="radio"/> (D) $2x^5 - 5x^4y + 20x^3y^2 - 20x^2y^3 + 10xy^4 - y^5$
___19.	Which of the following is the polynomial function whose graph passes through $(0, 4)$ , $(-2, 30)$ , and $(1, 6)$ ? <input type="radio"/> (A) $y = -9x + 10$ <input type="radio"/> (C) $y = 9x - 10$ <input type="radio"/> (B) $y = 5x^2 - 3x + 4$ <input type="radio"/> (D) $y = -5x^2 + 3x - 4$
___20.	Which model type best represents the set of values at the right? <input type="radio"/> (F) linear <input type="radio"/> (H) quadratic <input type="radio"/> (G) cubic <input type="radio"/> (I) quartic
___21.	Which polynomial function best models the data set at the right? <input type="radio"/> (A) $y = 0.00006006x^4 + 0.000119x^3 - 0.025x^2 + 2.13x + 71.6$ <input type="radio"/> (B) $y = 0.00002163x^4 + 0.001267x^3 - 0.155x^2 + 8.24x + 81.2$ <input type="radio"/> (C) $y = 0.00000312x^4 + 0.000197x^3 - 0.219x^2 + 5.22x + 86.3$ <input type="radio"/> (D) $y = 0.00000606x^4 + 0.000217x^3 - 0.079x^2 + 3.90x + 83.5$

x	-2	-1	0	1	2
y	-17	4	1	-2	-5

Paying Taxes for 1 Day

Year	Time Spent (minutes)
1940	83
1950	117
1960	130
1970	141
1980	145
1990	145
2000	160

Source: Tax Foundation

\_\_\_ 22. Using a cubic model for the data set at the right, what is the estimated Consumer Price Index for 1965?

(F) 102.5 (H) 116.564  
 (G) 130.034 (I) 147.384

**Consumer Prices**

Year	Index
1920	60.0
1930	50.0
1940	42.0
1950	72.1
1960	88.7
1970	116.3
1980	248.8
1990	391.4
2000	515.8

SOURCE: Bureau of Labor Statistics

\_\_\_ 23. Which of the following describes the transformation of the parent function  $y = x^3$  shown in the graph at the right?

(A) reflection across  $x$ -axis, vertical stretch by a factor of 2, and horizontal translation 1 unit left  
 (B) reflection across  $y$ -axis, vertical translation 1 unit up  
 (C) horizontal translation 2 units left, vertical translation 1 unit down  
 (D) vertical stretch by a factor of  $\frac{1}{2}$ , horizontal translation 1 unit right, and vertical translation 2 units down

\_\_\_ 24. Which of the following polynomial functions *cannot* be obtained from the parent function  $y = x^n$  using basic transformations?

(A)  $y = 6(x + 2)^3 - 3$  (B)  $y = (-x - 1)^4$  (C)  $y = \frac{x^2}{5}$  (D)  $y = x^2 + x$

\_\_\_ 25. Which quartic function has  $x = 3$  and  $x = 9$  as its only real zeros?

(F)  $y = (x + 6)^4 - 81$  (H)  $y = (x + 3)^4 - 81$   
 (G)  $y = (x - 6)^4 - 81$  (I)  $y = (x - 3)^4 - 81$