

Alg 2A Chapter 6 Review Spring 2017

1. Is each a polynomial? If no, explain why or circle the part or parts that are the reason.

a) $y = 5ix^2 + 9x + 6$

b) $f(x) = 10x^4 + 60x^{\frac{2}{3}} - 9$

c) $f(x) = 3x^6 - 7x + \frac{8}{x^2} + 90$

d) $y = -\sqrt{11} + 9.6x^2 - \frac{13}{17}x^5$

e) $f(x) = 8x^3 + 4\sqrt{x} - 9x^2 + 8$

f) $y = 7x^5 - 8x^2 + 68x^{-1} + 19$

g) $y = 7.1x^2 - \frac{5}{9}x$

2. Name each polynomial by its degree and by the number of terms.

a) $f(x) = -19x + 1$

b) $y = 4x^3 - 9x$

c) $f(x) = -3.1$

d) $\frac{3}{7}x^2 - 9x + 13.8$

3. State the degree(actual NUMBER), leading coefficient(actual NUMBER), and the end behavior of each polynomial.

a) $y = -14x^4 + 9x^3 - 7x^5 - 9x + 4$

b) $f(x) = -8x^2(5x + 1)(6 - x)^3(4x + 7)^2$

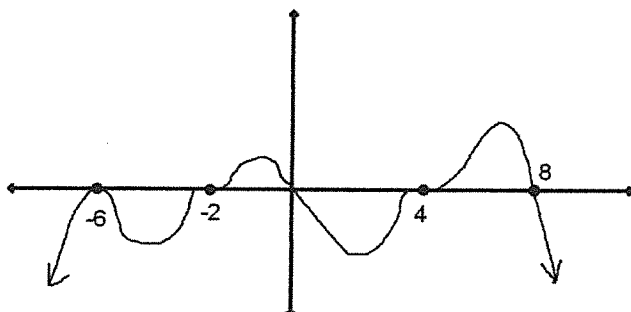
c) $y = 6x^3 - 9x^2 - x^4 - 9$

4. Sketch each function showing the proper end behavior and shape at each zero.

a) $f(x) = 3x^2(x - 2)(x - 5)(x + 4)^3$

b) $y = -(x + 2)^3(3x - 1)^2(x + 7)^3(x - 4)^2$

5. Write the EXACT polynomial equation, including the value of a , in factored form from the graph below given the graph passes through the point $(-1, 84375)$



6. Factor each, completely

a) $5x^5 + 5x^3 - 100x$

b) $9x^4 + 62x^2 - 7$

c) $x^4 - 22x^2 - 75$

d) $4x^5 + 16x^3 - 48x$

e) $15x^3 - 10x^2 + 9x - 6$

f) $x^3 + 64$

g) $27x^3 - 125$

7. Find all EXACT solutions, both real and imaginary. Give answers in simplified radical form where necessary

a) $x^4 - 23x^2 - 50$

b) $3x^5 + 3x^3 - 36x$

c) $3x^3 - x^2 - 48x + 16$

d) $6x^5 + 18x^3 - 168x$

e) $27x^3 - 8$

8. Expand each. Simplify.

a) $(2m - n)^5$

b) $(x - 3)^5$

c) $(2a + 3b)^4$

9. Find each quotient using any method you wish. Give remainders in any form.

a) $\frac{4x^3 + 2x - 10}{x + 3}$ b) $\frac{6x^3 - 13x^2 + 26x - 43}{3x - 5}$ c) $\frac{4x^4 + 12x^3 - 9x^2 - 3x + 2}{4x^2 - 1}$

10. Is $x - 4$ a factor of $3x^3 - 17x^2 + 21x - 7$? Give a reason for your answer.

11. Find just the remainder of this quotient. $\frac{8x^3 - 2x^2 + 9x + 5}{x - 2}$

12. Given $x + 3$ is a factor of $2x^3 - 3x^2 - 17x + 30$ find the other two factors.

13. Graph to find all real zeros. Round to the nearest hundredth. $y = 0.1x^4 + 1.2x^3 + 3.3x^2 - 3.6x - 9.8$

14. Use the following polynomial equation to find the coordinates of all absolute and relative extrema, if any. Round to the nearest hundredth. EQ: $y = 2x^3 - 8x^2 + 3x + 3$

15. Use this polynomial: $f(x) = 2x^3 - 3x^2 - 17x - 12$ Make a list all possible rational roots.

16. Use this polynomial: $f(x) = x^3 - x^2 - 10x - 8$

a) Make a list of all possible rational roots.

b) Which of these are actually roots?

17. Use this polynomial: $f(x) = 4x^4 + 13x^3 - 2x^2 - 39x - 30$

Given $\sqrt{3}$ is a root, find the other three roots.

18. Use this polynomial: $f(x) = 6x^4 + 11x^3 + 29x^2 + 44x + 20$

Given $2i$ is a root, find the other three roots.

19. Write the equation of a cubic, in STANDARD FORM, if two of its roots are $-7, \sqrt{2}$

20. Write the equation of a cubic, in STANDARD FORM, if two of its roots are $5, -3i$

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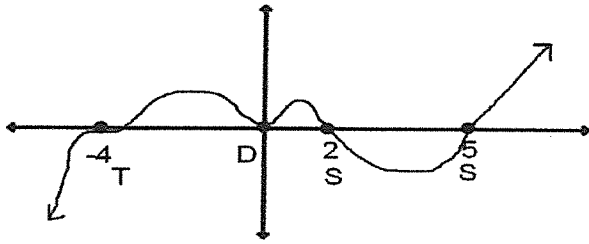
ANSWERS

1. a) No, imaginary coefficient b) No, fractional exponent c) No, x^2 in denominator is really x^{-2}
d) Yes e) No, $\sqrt{x}$ is really $x^{\frac{1}{2}}$ f) No, negative exponent g) Yes

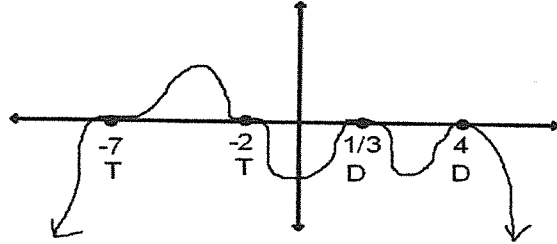
2.	<u>Name by degree</u>	<u>Name by # of terms</u>
a)	Linear	Binomial
b)	Cubic	Binomial
c)	Constant	Monomial
d)	Quadratic	Trinomial

3. a) Degree = 5 Leading Coefficient = -7 End Behavior: $(\nearrow, \searrow)$
 b) Degree = 8 Leading Coefficient = 640 End Behavior: $(\nearrow, \nearrow)$
 c) Degree = 4 Leading Coefficient = -1 End Behavior: $(\searrow, \searrow)$

4. a)



4. b)



5. $y = -3x(x+6)^2(x+2)^3(x-4)^3(x-8)$

6. a) $5x(x \pm 2)(x^2 + 5)$ b) $(3x \pm 1)(x^2 + 7)$

c) $(x \pm 5)(x^2 + 3)$ d) $4x(x^2 + 6)(x^2 - 2)$ e) $(3x - 2)(5x^2 + 3)$

f) $(x + 4)(x^2 - 4x + 16)$ g) $(3x - 5)(9x^2 + 15x + 25)$

7. a) $\pm i\sqrt{2}, \pm 5$ b) $\pm 2i, 0, \pm \sqrt{3}$ c) $\frac{1}{3}, \pm 4$

d) $0, \pm 2, \pm i\sqrt{7}$ e) $\frac{2}{3}, \frac{-1 \pm i\sqrt{3}}{3}$

8. a) $32m^5 - 80m^4n + 80m^3n^2 - 40m^2n^3 + 10mn^4 - n^5$

b) $x^5 - 15x^4 + 90x^3 - 270x^2 + 405x - 243$

c) $16a^4 + 96a^3b + 216a^2b^2 + 216ab^3 + 81b^4$

9. a) $4x^2 - 12x + 38$ $R = -124$ b) $2x^2 - x + 7$ $R = -8$ c) $x^2 + 3x - 2$

10. No, the remainder is -3 not zero (Evaluate the dividend with 4 and the result is -3 or actually do the division with synthetic or long division)

11. $R = 79$ (evaluate the dividend using 2 or you can actually do the division with synthetic or long division)

12. $x - 2$ and $2x - 5$ 13. Real zeros are: $x = -1.58, 1.68$

14. No Absolute Max or Min. Relative Max: $(0.20, 3.30)$ Relative Min: $(2.46, -8.26)$

15. $\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12, \pm \frac{1}{2}, \pm \frac{3}{2}$ 16. a) $\pm 1, \pm 2, \pm 4, \pm 8$ b) $-2, 4, -1$

17. Other three roots are: $-\sqrt{3}, -2, -\frac{5}{4}$ 18. Other three roots are: $-2i, -1, -\frac{5}{6}$

19. $f(x) = x^3 + 7x^2 - 2x - 14$

20. $f(x) = x^3 - 5x^2 + 9x - 45$