

Alg 2 Chapter 6 Review Fall 2018

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

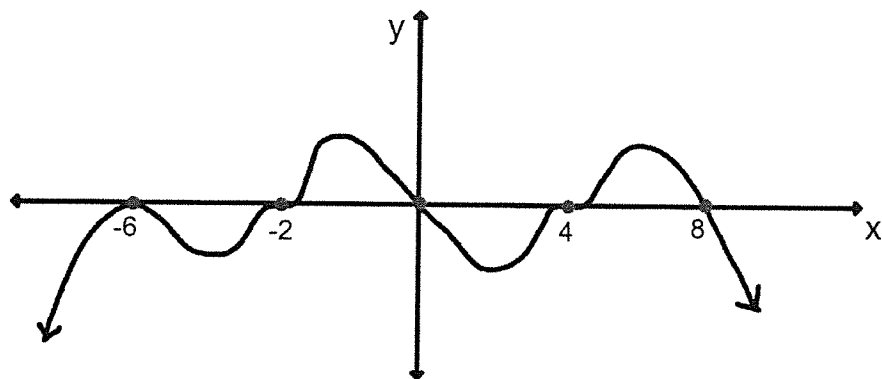
c) $y = 5x^3(2x + 7)^3(4x - 3)^2(6x + 7)(9 - x)$

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

7. Find all EXACT complex zeros/solutions by factoring. Simplify answers.

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

b) $3x^5 + 3x^3 - 36x = 0$

c) $12x^5 - 4x^4 - 192x^3 + 64x^2 = 0$

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

e) $8x^6 - 648x^2 = 0$

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) $\frac{4x^4 + 12x^3 - 9x^2 - 3x + 2}{4x^2 - 1}$

d) $\frac{9x^4 - 16x^3 - 4x^2 - 21x + 42}{x - 2}$

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

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

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

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

14. Use the given polynomials and zeros find the remaining EXACT complex zeros.

a) Polynomial: $y = x^6 - 2x^5 - 26x^4 + 4x^3 + 13x^2 + 70x + 840$ Zeros: 6 and -4

b) Polynomial: $y = 11x^4 - 31x^3 + 51x^2 - 93x + 54$ Zero: 2

15. Use the given polynomials to find all EXACT complex zeros by first graphing.

a) Polynomial: $y = x^4 + x^3 + 5x^2 + 7x - 14$

b) Polynomial: $y = 42x^4 + 71x^3 - 228x^2 - 179x + 30$

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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. Name by degree Name by # of terms

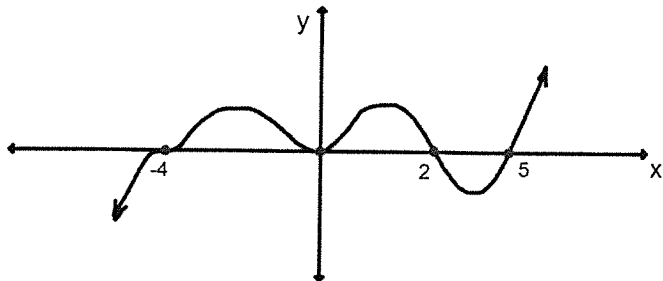
a) Linear	Binomial
b) Cubic	Binomial
c) Constant	Monomial
d) Quadratic	Trinomial

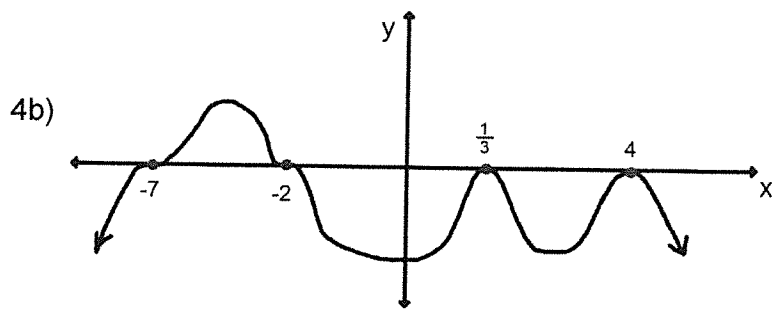
3. a) Degree = 5 Leading Coefficient = -7 End Behavior: ($\nearrow$, $\searrow$)

b) Degree = 8 Leading Coefficient = 640 End Behavior: ($\nearrow$, $\nearrow$)

c) Degree = 10 Leading Coefficient = -3840 End Behavior: ($\searrow$, $\searrow$)

4 a)





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

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

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) $x^2 + 3x - 2$ d) $9x^3 + 2x^2 - 21$

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

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

14. a) $x = \pm i\sqrt{5}, \pm \sqrt{7}$ b) $x = \pm i\sqrt{3}, \frac{9}{11}$

15. a) $x = \pm i\sqrt{7}, -2, 1$ b) $x = \frac{1}{7}, 2, -\frac{5}{6}, -3$