

Hon Algebra 2 Chapter 6 Review Fall 2016

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

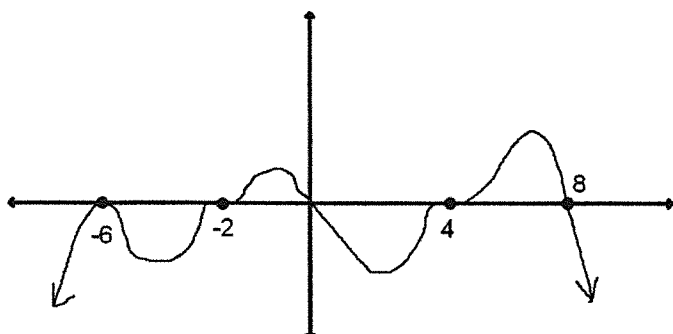
c) $y = 6x^3 - 9x^2 - x^4 - 9$

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 a possible polynomial equation in factored form from the graph below.



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) $(x - 3)^4$

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

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

a) $\frac{4x^3 - 9x^2 + 2x - 10}{x + 3}$

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 then find the remaining imaginary zeros. $y = x^4 + 3x^3 - x^2 + 9x - 12$

14. Find the coordinates of all absolute and relative extrema, if any. Round to the nearest hundredth.
 $y = 2x^3 - 8x^2 + 3x + 3$

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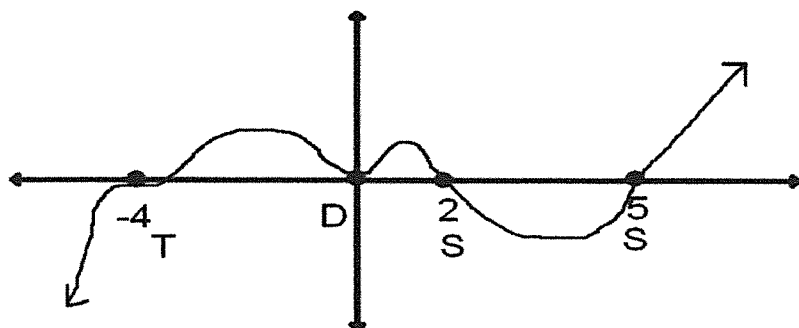
ANSWERS

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

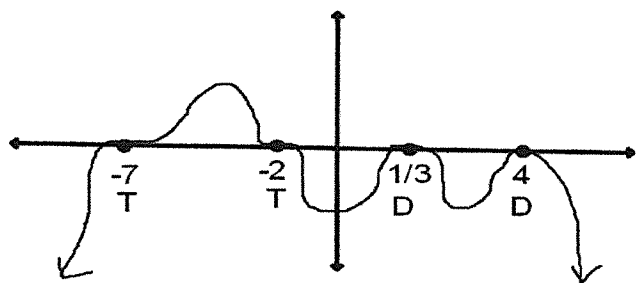
2.	<u>Name by degree</u>	<u>Name by # of terms</u>
a)	Linear	Binomial
b)	Cubic	Binomial
c)	Constant	Monomial
d)	Quadratic	Trinomial

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

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) $x^4 - 12x^3 + 54x^2 - 108x + 81$

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

9. a) $4x^2 - 21x + 65$ $R = -205$

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. Divide by $x + 3$ and factor the result: The other factors are: $2x - 5$ and $x - 2$

13. Solutions found by graphing are $x = -4, 1$ Using these to divide you are left with $x^2 + 3$ solutions from this factor are $\pm i\sqrt{3}$

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