Algebra 2 Review Chapter 6 Fall 2015

1. Is each a polynomial?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 it 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, leading coefficient, and the end behavior of each polynomial.

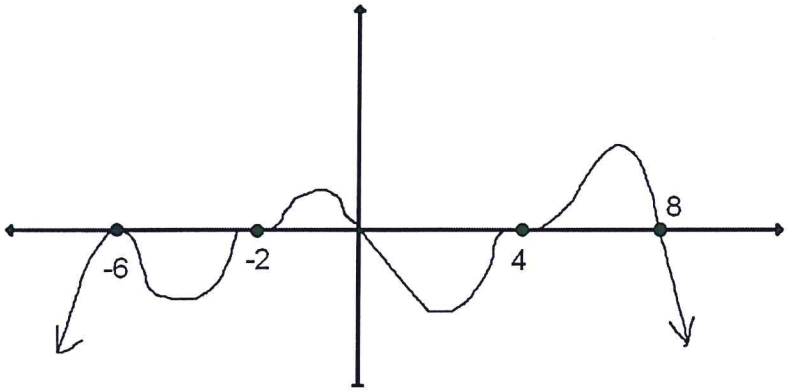
a) $y = -14x^4 + 9x^3 - 7x^5 - 9x + 4$ b) $f(x) = -8x^2(5x + 1)(6 - x)^3(4x + 7)^2$

c) $y = -x(x + 3)^2(2x - 7)^2(3x - 4)^3$ d) $y = 10x^3 - 109x^2 + x - 87$

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 polynomial in factored form from the graph below.



6. Factor each.

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 by factoring. Give answers in simplified radical form where necessary

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a) $x^4 - 23x^2 - 50 = 0$ b) $3x^5 + 3x^3 - 36x = 0$ c) $3x^3 - x^2 - 48x + 16 = 0$

d) $6x^5 + 18x^3 - 168x = 0$ e) $27x^3 - 8 = 0$ f) $5x^6 - 405x^2 = 0$

8. Use this polynomial: $y = -0.5x^4 - 0.5x^3 + 2.5x^2 - 0.5x + 2$

Round answers to the nearest hundredth when necessary.

a) Find all Absolute Maximums, if any. b) Find all Absolute Minimums, if any.

c) Find all Relative Maximums, if any. d) Find all Relative Minimums, if any.

e) Find all zeros, if any.

9. Find all real solutions by graphing. Round to the nearest hundredth when necessary.
$x^4 - 2x^3 - 3x^2 + 4x = -x^2 + 4x - 5$

10. Find each quotient using any method you wish. Give remainder in any form.

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

b) $\frac{6x^3 - 13x^2 + 26x - 43}{3x - 5}$

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

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

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

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

Algebra 2 Review Chapter 6 Fall 2015 ANSWERS

1. a) No b) No c) No d) Yes e) No f) No g) Yes

2.

	Name by degree	Name by # of terms
a)	Linear	Binomial
b)	Cubic	Binomial
c)	Constant	Monomial
d)	Quadratic	Trinomial

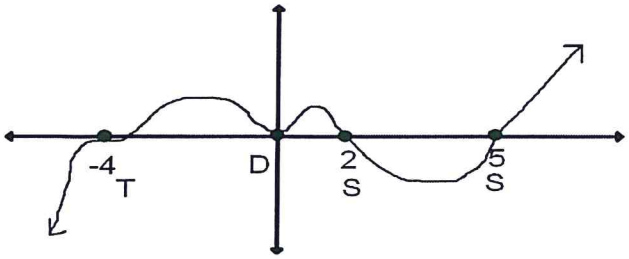
3. a) Degree = 5 Leading Coefficient = –7
End Behavior (↖, ↘)

b) Degree = 8 Leading Coefficient = 640
End Behavior (↖, ↗)

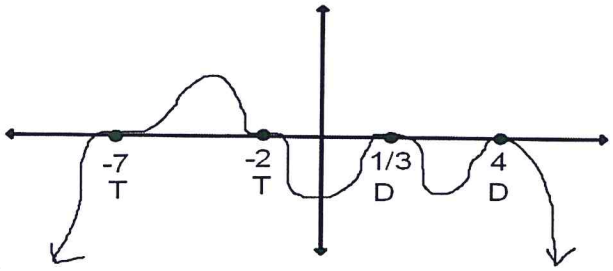
c) Degree = 8 Leading Coefficient = –108
End Behavior (↙, ↘)

d) Degree = 8 Leading Coefficient = 640
End Behavior (↙, ↗)

4. a)



4. b)



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

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

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

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

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) $\frac{2}{3}, \frac{-1 \pm i\sqrt{3}}{3}$ f) $0, \pm 3, \pm 3i$

8. a) Abs Max $= 9.01$ b) No Abs Min c) Rel Max $= 3.10$
d) Rel Min $= 1.97$ e) Zeros $= -2.96, 1.91$

9. $x = 1.31, 2.48$

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

b) $2x^2 - x + 7$ $R = -8$ c) $x^2 + 3x - 2$

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

12. $R = 79$ (evaluate the dividend using 2 or actually do the division)

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