Name_____ Period_____

Algebra 2 - Chapter 5 Review Worksheet

Section 5-1

Write each polynomial in standard form, classify it by name, degree and number of terms.

1. $6c^2 - 4c + 7 - 8c^2$

$-2c^2 - 4c + 7$

Quadratic trinomial

2. $(3x^2 - 1)(2x + 2)(x - 4)$

$(3x^2-1)(2x^2-8x+2x-8)$

$(3x^2-1)(2x^2-6x-8)$

$6x^4-18x^3-24x^2-2x^2+6x+8$

$6x^4-18x^3-26x^2+6x+8$

Quartic polynomial

3. $3x^2 - 5x - x^2 + 2x + 4x - 4x^3 - 1$

$-4x^3+2x^2+x-1$

Cubic polynomial

Section 5-2

Determine the standard form equation given the zeros.

4. $x = -2, 3, 0$ $(x+2)(x-3)x$

$(x^2-3x+2x-6)(x)$

$\boxed{x^3-x^2-6x}$

5. $x = -1, 1, 3, -3$

$(x+1)(x-1)(x+3)(x-3)$

$(x^2-1)(x^2-9)$

$x^4-9x^2-x^2+9$

$\boxed{x^4-10x^2+9}$

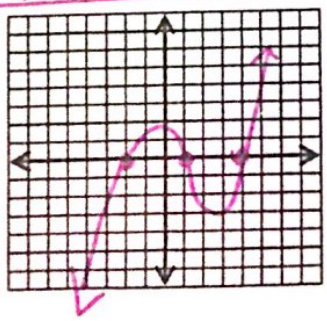
Sketch the zeros and determine the standard form equation.

6. $y = (x - 1)(x + 2)(x - 5)$

$(x-1)(x^2-5x+2x-10)$

$x^3-5x^2+2x^2-10x-x^2+5x-2x+10$

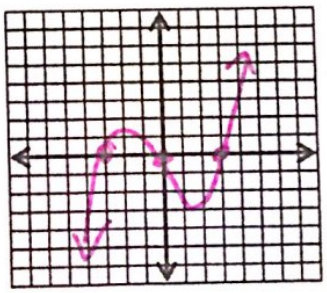
$\boxed{x^3-4x^2-7x+10}$



7. $y = x(x - 3)(x + 3)$

$x(x^2-9)$

x^3-9x



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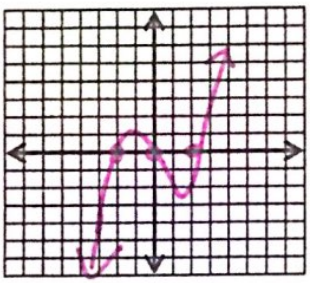
Factor and sketch the zeros of the function.

8. $y = x^3 - 4x$

$x(x^2-4)$

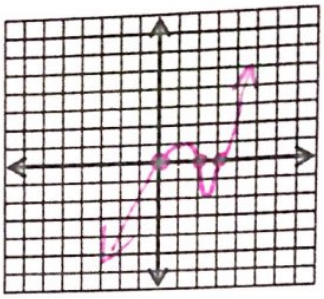
$x(x-2)(x+2)$



9. $y = x^3 + 5x^2 - 6x$

$y = x(x^2+5x-6)$

$= x(x-3)(x-2)$



Perform the indicated operations.

10. $(10x^3 - 7x^2 + 8x + 3) - (5x^2 + 2x - 9)$

$10x^3 - 7x^2 + 8x + 3 - 5x^2 - 2x + 9$

$\boxed{10x^3 - 12x^2 + 6x + 12}$

11. $(4x - 2)^3$

$1(4x)^3 + 3(4x)^2(-2) + 3(4x)(-2)^2 + 1(-2)^3$

$\boxed{64x^3 + -96x^2 + 48x - 8}$

12. $(x + 4)(2x^2 - 3x + 1)$

$2x^3 - 3x^2 + x + 8x^2 - 12x + 4$

$\boxed{2x^3 + 5x^2 - 11x + 4}$

Section 5-3

Factor each expression.

13. $t^3 + 8$

$(t+2)(t^2-2t+4)$

14. $8b^3 - 125$

$(2b-5)(4b^2+10b+25)$

15. $27n^3 - 8m^3$

$(3n-2m)(9n^2+6mn+4m^2)$

16. $w^4 - 125w$

$w(w^3-125)$

$w(w-5)(w^2+5w+25)$

17. $b^4 - 8b^2 + 16$

$(b^2-4)(b^2-4)$

$(b-2)(b+2)(b-2)(b+2)$

18. $1 - 64z^3$

$(1-8z)(1+8z+64z^2)$

19. $6x^4y^3 + 18xy - 3x^2y^2$

$3xy(2x^3y + 6 - xy)$

20. $25m^2 - 64n^2$

$(5m-8n)(5m+8n)$

Factor each expression and solve.

21. $x^3 + 27$

$(x+3)(x^2-3x+9)$

$x = -3, \frac{3 \pm 3i\sqrt{3}}{2}$

$\frac{3 \pm \sqrt{9-4(1)(9)}}{2(1)} = \frac{3 \pm \sqrt{9-36}}{2} = \frac{3 \pm \sqrt{-27}}{2}$

$= \frac{3 \pm 3i\sqrt{3}}{2}$

22. $y^4 - 17y^2 + 16$

$(y^2-1)(y^2-16)$

$(y-1)(y+1)(y-4)(y+4)$

$\boxed{y = \pm 1, \pm 4}$

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$x = -4$

$x^2+4x+16$

23. $64 - x^3$ $(4-x)(16+4x+x^2)$

$\frac{-4 \pm \sqrt{16-4(1)(16)}}{2}$

$\frac{-4 \pm \sqrt{-48}}{2} = \frac{-4 \pm 4i\sqrt{3}}{2} = \boxed{-2 \pm 2i\sqrt{3}}$

24. $w^4 - 50w^2 + 49$

$(w^2-1)(w^2-49)$

$(w-1)(w+1)(w-7)(w+7)$

$\boxed{w = \pm 1, \pm 7}$

Section 5-4

Use long division to divide.

25. $x + 3)\overline{x^3 + 2x^2 + 5x + 12}$

$x^2 - x + 8$

$x^3 + 3x^2$

$-x^2 + 5x$

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

$8x + 12$

$-8x + 24$

-12

$\boxed{x^2 - x + 8 - \frac{12}{x+3}}$

26. $2y - 1)\overline{2y^4 + 3y^3 - 4y^2 + y + 1}$

$y^3 + 2y^2 - 2y + 1$

$-(2y^4 - y^3)$

$4y^3 - 4y^2$

$-(4y^3 - 2y^2)$

$-2y^2 + y$

$-(-2y^2 - y)$

$2y + 1$

$-(2y - 1)$

2

$y^3 + 2y^2 - y + 1 + \frac{2}{2y-1}$

27. $x + 2)\overline{x^4 - 5x^2 + 4x + 12}$

x^3

$x^4 - 2$

$x^3 - 2x^2 - x + 6$

$x+2 \overline{)\, x^4 + 0x^3 - 5x^2 + 4x + 12}$

$x^4 + 2x^3$

$-2x^3 - 5x^2$

$-(-2x^3 - 4x^2)$

$-x^2 + 4x$

$-(-x^2 - 2x)$

$6x + 12$

$6x + 12$

0

$\boxed{x^3 - 2x^2 - x + 6}$

Use synthetic division to divide.

28. $\frac{x^4 - 2x^3 + 5x^2 + 7x + 2}{x+1}$

-1	1	-2	5	7	2
		-1	3	-8	1
	1	-3	8	-1	$\boxed{3}$

$\boxed{x^3 - 3x^2 + 8x - 1 + \frac{3}{x+1}}$

29. $\frac{4n^3 - 6n^2 + 2n - 7}{n-2}$

2	4	-6	2	-7
		8	4	12
	4	2	6	5

$4n^2 + 2n + 6 + 5/n-2$

30. $\frac{2h^4 + 3h^3 + 8h - 1}{h+3}$

-3	2	3	0	8	-1
	↓	-6	9	-27	57
	2	-3	9	-19	$\boxed{56}$

$2h^3 - 3h^2 + 9h - 19 + 56/h+$

Evaluate using synthetic division and substitution.

31. Find $P(-2)$ for $P(x) = x^3 - 4x^2 - x - 6$

$P(-2) =$

$(-2)^3 - 4(-2)^2 - (-2) - 6$

$-8 - 4(4) + 2 - 6$

$-8 - 16 + 2 - 6$

$-24 + 2 - 6$

$-22 - 6 = -28$

32. Find $P(2)$ for $P(x) = -2x^4 + 3x^3 - 5x^2 + 4x + 1$

$-2(2)^4 + 3(2)^3 - 5(2)^2 + 4(2) + 1$

$-2(16) + 24 - 20 + 8 + 1$

$-32 + 24 - 20 + 8 + 1$

$-8 - 20 + 8 + 1$

$-28 + 8 + 1$

$-20 + 1 = -19$

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Section 5-7

33. Write out Pascal's Triangle to 8 rows.

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
1 7 21 35 35 21 7 1
1 8 28 56 70 56 28 8 1

Expand using Pascal's Triangle.

34. $(y-2)^3$

$y^3 + 3y^2(-2) + 3(y)(-2)^2 + (-2)^3$

$\boxed{y^3 - 6y^2 + 12y - 8}$

35. $(2x+3)^4$

$1(2x)^4 + 4(2x)^3(3) + 6(2x)^2(3)^2 + 4(2x)(3)^3 + (3)^4$

$\boxed{16x^4 + 96x^3 + 216x^2 + 216x + 81}$

36. $(x+2y)^5$

$1(x)^5 + 5(x)^4(2y) + 10(x)^3(2y)^2 + 10(x)^2(2y)^3 + 5(x)(2y)^4 + (2y)^5$

$\boxed{x^5 + 10x^4y + 40x^3y^2 + 80x^2y^3 + 80xy^4 + 32y^5}$

37. Make a rough sketch of the polynomial:

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

$5+2+2+1$

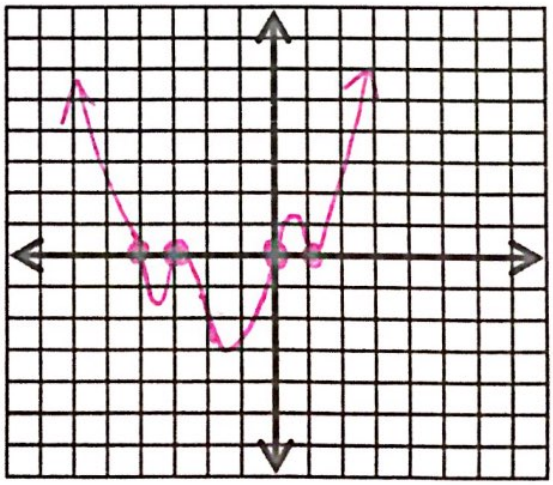
Degree: 10 even Pos LT

End Behavior: as x → ∞, y → ∞

as x → -∞, y → ∞

Zeros & Multiplicity:

X=0 m=5 (cross)
X=-3 m=2 (touch)
X=1 m=2 (touch)
X=-4 m=1 (cross)



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