

\* Ignore the numbering \*

## Chapter 6 Review WS

6.2 Determine the characteristics of a polynomial

7) Given:  $f(x) = -2x^4 + 4x^2 - 2$

Leading Coefficient	Degree	Right Side Behavior	Left Side Behavior	Y- intercept
-2	4	down	down	(0, -2)

8) Given:  $f(x) = 4x^3 + x^2 + 3$

Leading Coefficient	Degree	Right Side Behavior	Left Side Behavior	Y- intercept
4	3	up	down	(0, 3)

6.3/6.4

Add/subtract the given polynomials.

9)  $(4x^2 - 8x + 8) - (7x^2 - 3x + 6)$

$$4x^2 - 8x + 8 - 7x^2 + 3x - 6$$

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

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

$$5x^3 - 10x^2 + 5 + 2x^3 - 6x^2 + 8x + 10$$

$$\boxed{7x^3 - 16x^2 + 8x + 15}$$

Multiply the given polynomials.

11)  $(2x^2 + 5x - 3)(x - 3)$

$$2x^3 - 6x^2 + 5x^2 - 15x - 3x + 9$$

$$\boxed{2x^3 - x^2 - 18x + 9}$$

12)  $[(x+3)(x-4)](x+2)$

$$(x^2 - x - 12)(x+2)$$

$$x^3 + 2x^2 - x^2 - 2x - 12x - 24$$

$$\boxed{x^3 + x^2 - 14x - 24}$$

Divide.

$$(x^3 + 9x^2 + 23x + 15) \div (x + 5)$$

$$\begin{array}{r} x^2 + 4x + 3 \\ x+5 \overline{) x^3 + 9x^2 + 23x + 15} \\ \underline{-(x^3 + 5x^2)} \phantom{+ 15} \phantom{+ 15} \\ 0 \phantom{x^3} + 4x^2 + 23x \phantom{+ 15} \\ \underline{-(4x^2 + 20x)} \phantom{+ 15} \\ 0 \phantom{x^3} \phantom{x^2} + 3x + 15 \\ \underline{-(3x + 15)} \\ 0 \phantom{x^3} \phantom{x^2} \phantom{x} + 0 \end{array}$$

$$\boxed{x^2 + 4x + 3}$$

6.5 Factoring.

13) Factor the sum/difference of cubes.

$$x^3 - 27$$

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

14) Factor by grouping.

$$2x^3 + 6x^2 - 5x - 15$$

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

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

6.6 Factor completely:

$$15) 2x^4 + 4x^3 - 6x^2$$

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

$$\boxed{2x^2(x+3)(x-1)}$$

$$16) 2x^4 - 32$$

$$2(x^4 - 16)$$

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

$$\boxed{2(x-2)(x+2)(x^2+4)}$$

$$17) x^4 + 8x^2 + 12$$

$$\boxed{(x^2 + 6)(x^2 + 2)}$$

Factor and Solve:

18)  $x^4 - 10x^2 + 9 = 0$

$$(x^2 - 9)(x^2 - 1) = 0$$

$$(x+3)(x-3)(x+1)(x-1) = 0$$

$$\boxed{x = -3, 3, -1, 1}$$

20)  $x^4 - 15x^2 - 16 = 0$

$$(x^2 - 16)(x^2 + 1) = 0$$

$$(x-4)(x+4)(x^2 + 1) = 0$$

$$\boxed{x = 4 \quad x = -4 \quad x = \pm 1i}$$

19)  $x^5 + x^3 = 12x$

$$x^5 + x^3 - 12x = 0$$

$$x(x^4 + x^2 - 12) = 0$$

$$x(x^2 + 4)(x^2 - 3) = 0$$

$$\boxed{x = 0 \quad x = \pm 2i \quad x = \pm \sqrt{3}}$$

21)  $2x^6 - 8x^4 + 6x^2 = 0$

$$2x^2(x^4 - 4x^2 + 3) = 0$$

$$2x^2(x^2 - 3)(x^2 - 1) = 0$$

$$2x^2(x^2 - 3)(x+1)(x-1) = 0$$

$$\boxed{x = 0 \quad x = \pm \sqrt{3} \quad x = -1 \quad x = 1}$$

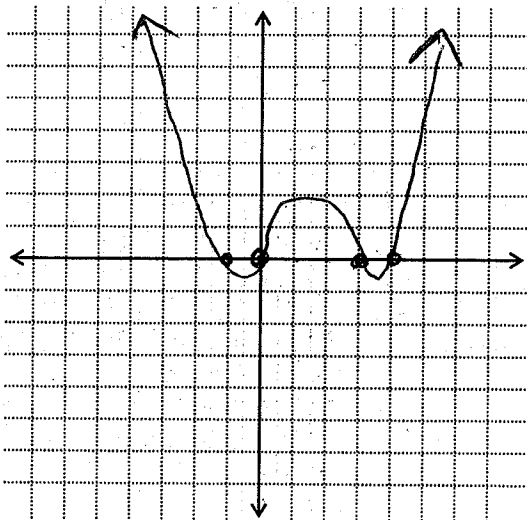
6.7 Modeling:

Draw a graph of the function given the function in factored form:

22)  $f(x) = x(x-3)(x+1)(x-4)$

# of x's  
Degree: 4

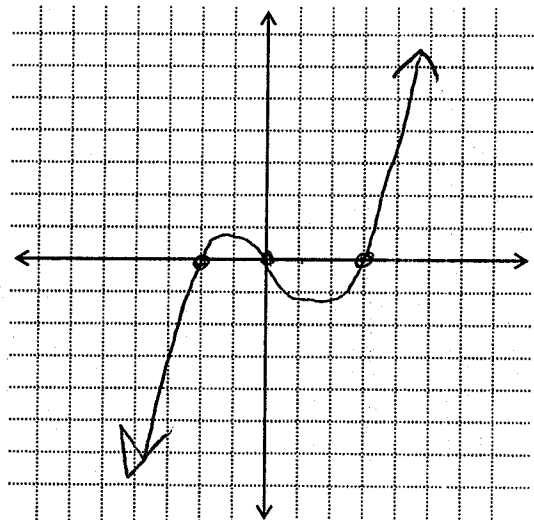
x-intercepts/zeros: 0, 3, -1, 4



23)  $f(x) = x(x-3)(x+2)$

Degree: 3

x-intercepts/zeros: 0, 3, -2



24) Use the graph at the right to answer the questions...

Even or odd degree?

even

Positive or negative leading coefficient?

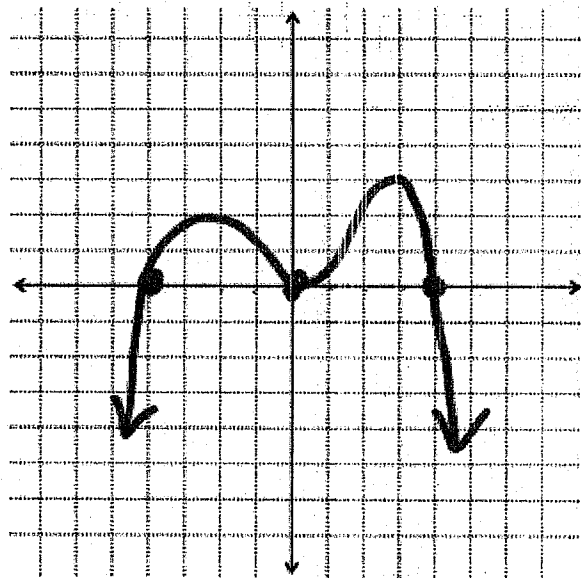
negative

What are the zeros?

-4, 0, 4

Write an equation to represent the graph

$f(x) =$  \_\_\_\_\_



$$f(x) = x(x+4)(x-4)$$

← factored form

$$f(x) = x^3 - 16x$$

← standard form